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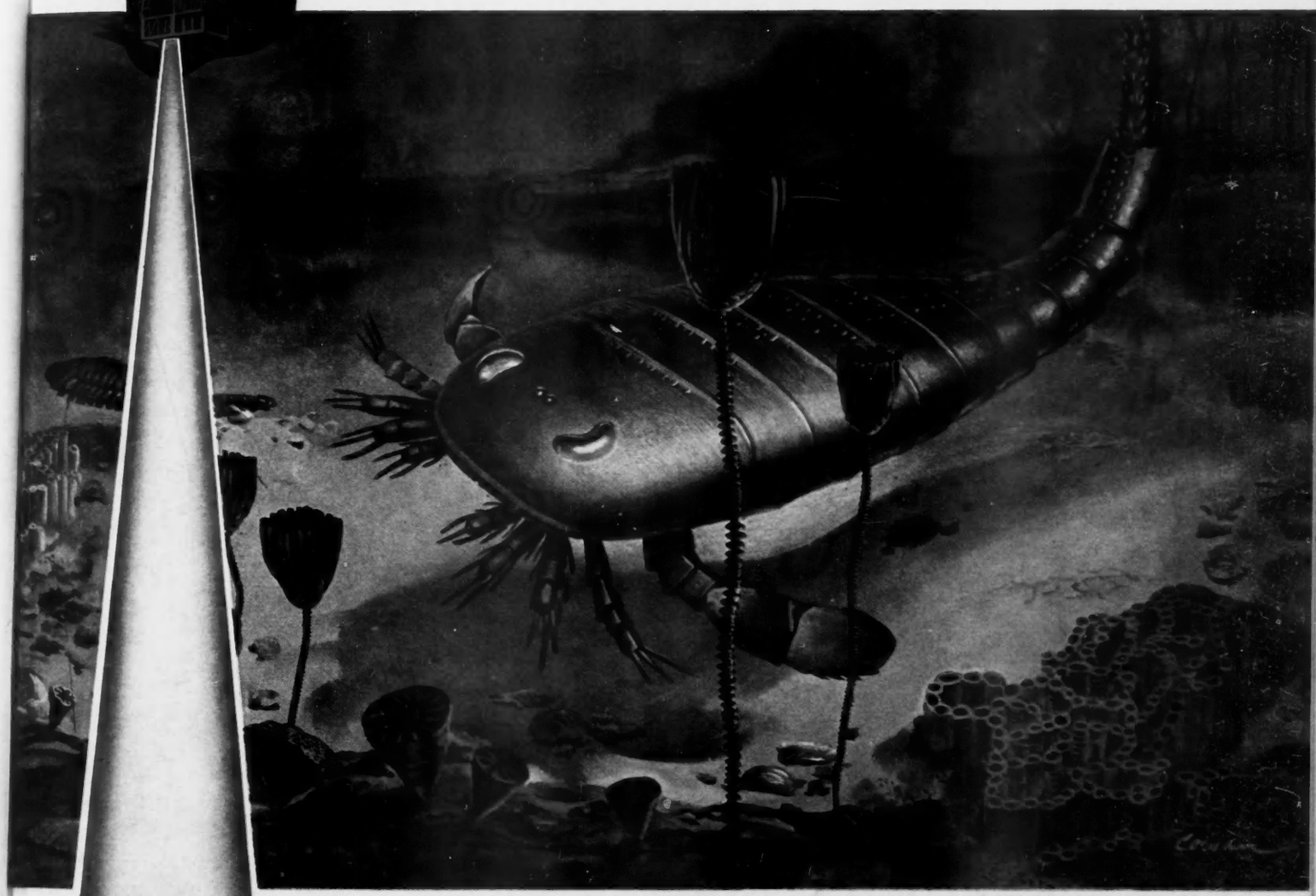
The OIL WEEKLY

FOR THE DRILLING, PRODUCING, PIPE LINE INDUSTRY

Thru the Ages with Hughes Rock Bits



Painted for the Hughes Tool Research Division Collection by John Pemberton Cowar

THE SILURIAN PERIOD represents an advance in the evolution of life from the preceding (Ordovician) period. Reconstructed above* is an Eurypterid, a more complex Trilobite, living among Crinoids and Corals.

*Full size color prints of this original painting will be sent upon request.

Beneath the impregnable barriers of hard lime rock, abrasive sandstone and dolomite of the Silurian formations, nature secreted vast oil deposits and challenged man to find them. The HUGHES ROCK BIT answered this challenge and became the means of funneling oil to the earth's surface through the deepest and hardest formations.

The SUPER RUGGED HUGHES W7R ROCK BIT is the preferred standard of the drilling industry in all of the hardest formations for straight hole maximum speed and footage at minimum cost.

Hughes TOOL COMPANY HOUSTON, TEXAS

Standard of the Industry

15 CENTS PER COPY August 26, 1946 VOLUME 122, NUMBER 13

- **324° F. BOTTOM-HOLE TEMPERATURE**
- **11456 FEET OF CASING**
- **5000 PSI TRUCK PRESSURE**

They squeezed out 110 sacks, reversed out 10 and the slurry remained fluid and pumpable from first to last. "A jamb-up job," said the superintendent.

Because of its delayed, its postponed, its *retarded* set, Unaflo does not stiffen prematurely. In the deepest wells, in the hot ones, the tight ones, it *stays fluid* and *pumpable* during its entire period of retardation. Then it hardens to a solid, impervious seal.

Send for "Unaflo Oil-Well Tables," a shirt-pocket booklet of down-the-well volumes of cement and mud. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Amicable Building, Waco; Oklahoma City; Birmingham; Chicago; New York. Export Distributors, United States Steel Export Company, New York.

OW-U-73

Unaflo *Retarded* **Cement**
Resistant to Sulfate Waters

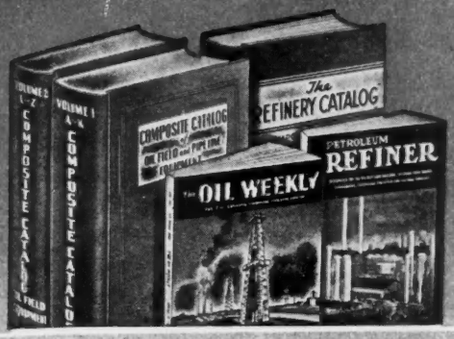
Atlas Portland Cement—Type I

Atlas Portland Cement—Type II
Resistant to Sulfate Waters

Atlas High-Early Cement—Type III

UNIVERSAL ATLAS CEMENT COMPANY

U. S. STEEL RADIO SHOW — *Sunday Evenings — Consult local newspaper for time and station.*



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Looking Ahead

WITH THE EDITOR

ALTHOUGH faced with unsettled political conditions, the Middle East oil region is a beehive of activity with exploration, production and refining programs progressing rapidly.

SAUDI ARABIA

This high tempo of activity in the Persian Gulf area is in sharp contrast with the inaction, and in many cases deterioration, that marks the present status of the industry in Eastern Europe.

Regarded as the site of a huge store of petroleum, the Middle East now is faced with two disturbing factors. They are politics and shortage of materials. However, even against these handicaps the Middle East sector is expected to pass 600,000 barrels daily this year, and if political hazards do not interfere too seriously, it will pass the million-barrel-a-day mark probably early in 1948.

The oil situation in the Middle East will be discussed by Henry Ozanne, Staff Writer, in a series of articles in THE OIL WEEKLY, the first of which will appear in the monthly International Feature Issue of September 2. The initial article will deal with the activities in Saudi Arabia.

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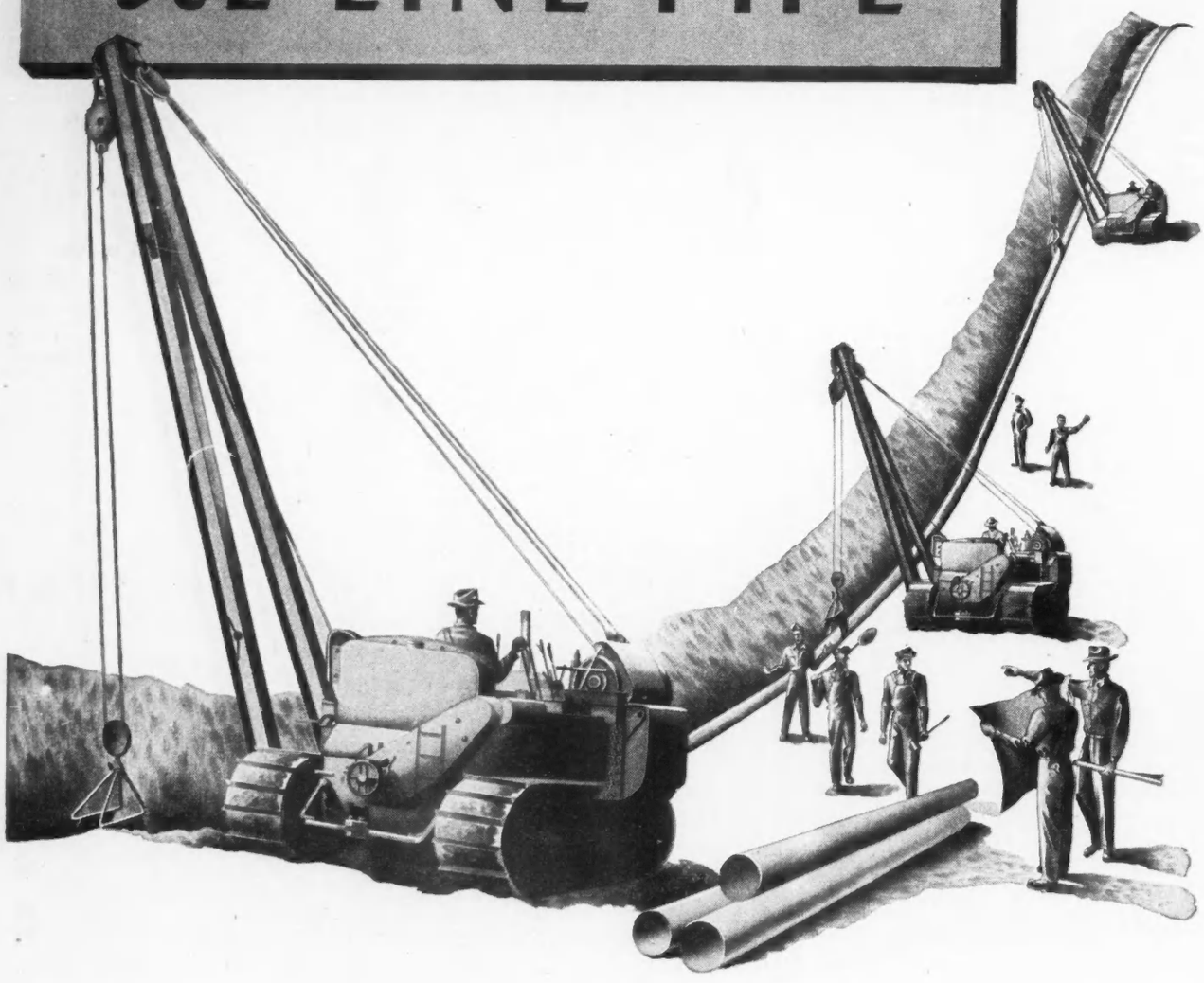
THE LINE OF LEAK RESISTANCE

J&L LINE PIPE



J&L Line Pipe has earned the title of "the line of leak resistance" through years of trouble-free service in the field. Specify J&L Line Pipe for your next pipe line—you will find it serves you well.

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The Changing Panorama

Control of Petroleum And the U. S. Policy

VARIOUS significant elemental facts regarding present control and development of petroleum resources were thrown into bold relief recently when three U. S. officials broadcast a frank discussion of international oil situation. Participants were Col. G. H. Volgel, executive officer of the Army-Navy Petroleum Board, John A. Loftus, chief of the petroleum division of the State Department, and Charles B. Rayner, State Department petroleum adviser.

Enunciated were these official views: (1) the U. S. possibly may have to import as much as half of its petroleum requirements by 1965, (2) the U. S. government therefore is considering further conservation of oil reserves within this country, (3) oil is and will continue a point of friction and conflict among nations unless peace-promoting controls are established, preferably under the United Nations, (4) American control of about 42 percent of the Middle East's rich reserve is "extremely important" to U. S. public interest because of potential import needs and the "strategic" value of the oil, (5) Standard Oil Company of California and The Texas Company concessions in Saudi Arabia are the greatest U. S. asset in the Middle East, making a strong, unified government in Arabia important to American interests, and making it a matter of concern that trouble in Palestine is holding up construction of the American pipe line across Arabia to the Mediterranean.

In addition, the speakers officially brought out into the open the clash of American and Russian interests over the oil of Europe and the Middle East. They disclosed that the U. S. is trying to get Russia to turn the Hungarian oil fields back over to their owners, Standard Oil Company (New Jersey), instead of ruining them by overproduction; that the Russians have removed some American equipment from the Roumanian oil fields and are taking half their Roumanian reparations in oil, developed largely by British, French, and American interests; and that the Russians also are claiming some of the Anglo-American fields in their zone of Austria as reparations.

Also cited was the present estimate that Russian oil production actually has been running far below prewar rates, particularly in the Baku fields, because of reduced drilling during the war. It now appears clear that estimates or rather guesses for recent years were much too high.) This decline was given as one of the reasons for Russia's desire to develop oil in northern Iran as well as Russia's encroachment on European sources. A primary future source for Russia will be the Ural-Volga region, it was stated.

Russia In S. A.

FROM Venezuela comes the ugly news that Russian efforts to sabotage the United States are not confined to the peace conference nor the Balkans.

Nearly a year ago THE OIL WEEKLY carried the story that the Soviet Union had vastly increased its personnel in certain South American capitals. Bogota was listed as one where no possible trade prospects could account for the large number of employes added. Later reports said a similar thing about Caracas. A returning representative of THE OIL WEEKLY last January brought similar news from Buenos Aires.

Now American interests know at least part of what the Soviets have in mind. American business interests in Venezuela, among which the oil companies were only a part, joined in a letter last week to the American ambassador calling for official recognition on the part of the American government of the deliberate campaign under way by Communists in Venezuela attempting to discredit all things American. Apparently the work of the Soviet "diplomats" is bearing fruit. The Communist party is getting stronger in Venezuela and, if we read the pattern correctly, it is following the party line of smearing the USA. American business men in Caracas are tired of seeing us turn the other cheek to an adversary who religiously clouts us on the turned side ever time our head moves.

If we were connected with the South and Central American governments where Soviet embassies have been or are being stuffed with a surplus of new employes, we would wonder if the only reason is an attempt to destroy the friendship of those countries with the United States. We would wonder if a part of their work isn't to undermine the very governments to whom they have been accredited. Could be!

Oil Supplies for War and Peacetime

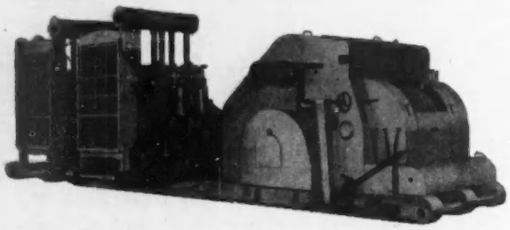
WHILE we agree that Near Eastern oil reserves are very important to the United States, we regret that the U. S. State Department in its statement last week placed so much emphasis on the importance of this oil as a war time reserve. Doubtless, it is necessary to the interests of the American people that there be no foreign molestation of our friendly status to the countries owning the oil—but it is as a peacetime supply that this oil holds, in our opinion, the highest value.

A considerable time ago when the matter was receiving national attention in connection with the proposed "Petroleum Reserve, Inc." we queried Army, Navy and oil men in Washington as to their opinion as to whether or not Near Eastern reserves could be defended by the United States in the event of war with either a first or second class European or Asiatic power. None felt that it could be successfully defended, although the ultimate outcome of such a war would undoubtedly return the properties to the present owners.

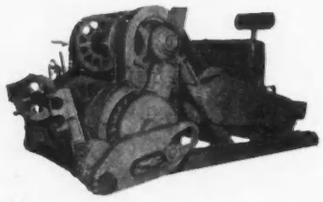
Unless there comes a substitute for petroleum fuel the United States will ultimately have to import more oil than she is now importing, it is true. But this does not need give rise to hysteria. It simply means that the people of these United States have a definite interest in seeing that a reasonable portion of the world's oil is under development by American companies. Reasonable diplomatic and moral co-operation will do that job.

The war emergency is another thing . . . and a very important thing. There is a part of the world in which we can defend successfully the supplies necessary to an American or Western Hemispheric victory. The United States is already committed to assist in the defense of the area in question against the aggression of any outside power. That area is South America. And, as has been noted elsewhere on this page, an unfriendly power is actively attempting to embarrass American business, including oil, interests there.

"CARDWELL" DRILLING AND SERVICING RIGS



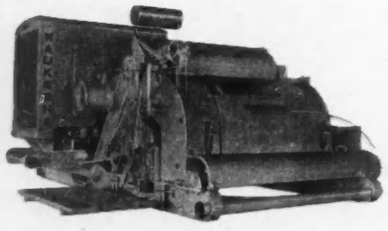
MODEL O—Twin-engine, double drum draw works for drilling to 8,000 feet with 4½" drill pipe. V-belts drive to pump and draw works. "Cardwell" chain transmission has three speeds forward and one reverse. Dual drum drives provide six speeds forward and two reverse to lower drum. Twin Disc friction clutches drive pump, draw works and rotary table. Engines and V-belts can be removed without disturbing bearing alignment.



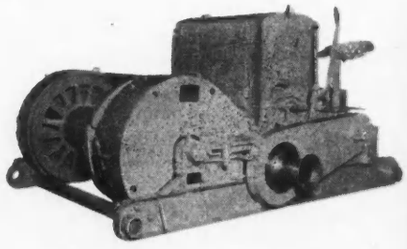
MODELS H, K or R—Combination rotary or cable tool (spudder or beam) double drum drilling rigs. Rotary drilling to 5,000 feet with 4½" drill pipe, cable tools to 7,500 feet, and servicing to 10,000 feet. Spudding assembly is interchangeable with rotary assembly in three to four hours on location. Beam and rotary can be installed on Models K and R, so changeover from rotary to cable tools or pumping can be made without rig changes. Friction clutch drives make it possible to "drill-up" through cave-ins, or lift tools without stopping spudder.

"CARDWELL" RIGS "FIT THE FIELD" FOR BOTH ROTARY AND CABLE TOOL OPERATIONS

Heavy-duty brakes are self-energizing, full wrap type. Brakes have positive equalization, are fully adjusted by single turnbuckle, and the woven asbestos lining is interchangeable. Demountable brake flanges are heat-treated for surface hardness and ground to furnish a smooth, polished surface. All chains are Diamond long life, high efficiency type. Shafts are ground to close fits from heat-treated alloy steel. Every wearing part is heat-treated for longest wear. All "Cardwell" rigs are light weight, fully portable and designed to fit within road limits. Single and double leg servicing masts, double leg drilling masts, and telescoping alloy steel pipe portable derricks are available. Day and night parts service is available from conveniently located parts stock stores. Operating and maintenance instructions and fully illustrated parts books are included with each rig. Spanish and English books are available for machines shipped to Latin-American countries.



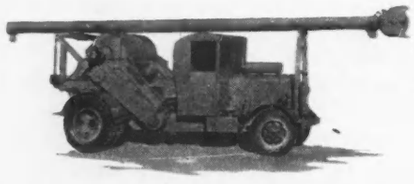
MODEL S—Single engine draw works for drilling up to 4,500 feet with 4½" drill pipe, or workover jobs to 10,000 feet. This rig is designed and built for fast drilling with one large engine which drives through "Cardwell" five-speed, even-step transmission. Dual drum drives furnish ten speeds forward and two reverse. Rotary table has five speeds. Engines up to 202 HP are available.



MODELS Q, H, K or S—Four sizes of single drum servicing hoists for wells 2,000 to 12,000 feet in depth. Positive jaw clutches and SKF bearings insure a free-rolling drum. Rotary table drive assembly is available for Models H, K and S; spudder available for Models H and K.

MODEL E—Twin-engine, double drum draw works for drilling to 6,000 feet with 4½" drill pipe or workover jobs to 12,000 feet. Friction clutch high drive outside of transmission permits fast lift of block without shifting gears. Six speeds and reverse to both drums, and five speeds to rotary table. Either or both engines may be used to drive draw works, rotary table or pump. When rotating, no chains are running except to table, although catheads or drum may be engaged through friction clutches without stopping table or pump. Main drive chains run in spray of oil. "Cardwell" patented single bearing power take-off for both engines insures bearing alignment.

CARAVAN RIG—90-foot telescoping pipe derrick for drilling operations to 5,500 feet, or workover jobs to 10,000 feet. Derrick telescopes to one-half its length and is carried on semi-trailer with utility section. Engine operates hydraulic rams and winch for raising and extending derrick, and drives rotary table, light plant, washdown pump, air compressor, electric welder, and hydraulically raised telescoping doghouse. This is a complete portable drilling rig with which any draw works may be used. Rotary table and blocks are moved in place as a part of the derrick.



MOBILHOIST—Self-propelled, rubber tired, combination rotary or cable tool drilling or servicing rig for drilling to 1,500 feet with rotary, 3,500 feet with cable tools or 4,500-foot servicing jobs. "Cardwell" five-speed and reverse transmission — heavy-duty power take-off and axles—dual wheels—jaw clutch in lower drum —hydraulically-operated friction clutch in upper drum. Spudder and rotary drive are available.

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REG. U.S. PAT. OFF. TRADE MARK
THIS TRADE MARK INSURES HIGHEST QUALITY AT LOWEST PRICE

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"CARDWELL" RIGS LAST LONGER AND REQUIRE FEWER REPAIRS

The Week's News

STATE Department warnings of a 50 percent deficiency in domestic oil output within 20 years marked the launching of a campaign to put international oil problems under the United Nations. Strife in Palestine and Russian aggression shown as handicaps facing American operators in the Middle East and Europe. IPAA decries talk of shortage. Pages 21 and 23.

Steel Cut-Back Threat—A possible serious cut-back in steel production may result from the shortage of pig iron and scrap, adding to the 16 million-ton production lost earlier this year from strikes. Producers foresee difficulties in deliveries extending well into next year. Page 26.

Public Lands Oil Output—Crude oil production on the public lands rose to a new peak during the past fiscal year, running close to 60 million barrels, and natural gas output topped 96 million mfc, the Geological Survey reports. Page 25.

API Meeting Plans—Schedule of production committee meetings has been tentatively prepared for the API sessions in Chicago in November. Plans announced for special train. Page 26.

Lease Regulations—Lease-holders and prospective lessees will have a chance September 30-October 1 to hear in Denver the government's explanation of regulations set up under the new lease act. Page 27.

Oil Price Control—The Price Decontrol Board has disposed of its primary task of deciding whether temporarily-released agricultural commodities should go back under price ceilings, but with no indications that it will consider the return of petroleum so long as present price levels are maintained. Page 26.

Land Disposal—President Truman's comment about the need for keeping mineral rights on lands being returned by the government has slowed down disposal of such tracts. Page 25.

Varied Reactions Noted to Broadcast Giving State Department Views on Oil

Assertions by State Department officials that within 20 years the United States may be dependent upon imports for nearly 50 percent of her oil requirements may result in efforts to speed up the development of synthetic-fuel production in this country.

The statement by John A. Loftus, chief of the petroleum division, that by 1965 our requirements will be in the neighborhood of 6.5 million barrels a day, while we will be producing only about 3.5 million barrels "in economic competition with foreigh fields", brought an immediate retort from Senator Joseph C. O'Mahoney of Wyoming that with tremendous deposits of shale and coal from which synthetic fuels can be produced it is "altogether absurd to speak of the United States running out of oil."

"It is not necessary for the United States to risk its future between the imperial ambitions of Great Britain and the expansionist policies of Russia which now threaten to make the East and Near East the actual scene of Armageddon," O'Mahoney declared.

The question of future oil supplies was raised by Loftus in the course of a radio broadcast. (See page 21.)

Protests Aired

The broadcast brought loud protests from industry spokesmen, who charged the government was again resorting to philosophies which before the war, led the industry to believe strict federal regulation of domestic operations was being sought.

Oil men saw in the proposal for a world organization a plan to give the United Nations more than purely consultive powers, basing that belief on an answer by Loftus to a question whether the organization would be purely advisory.

"Maybe not," Loftus said, adding "as far as oil is concerned, it begins to look as if the foreign activities of American oil companies are a matter of real public concert—that they're vested with the public interest, something like public utilities."

"Well, then, do you mean that the world organization would have more than advisory powers?" Loftus was asked.

"Could be," he replied.

"And they should be implemented in such a way as to assure the orderly production and distribution of the world's oil in the future?" he was asked.

"That's right," Rayner interjected.

Industry members saw the broadcast as more than a mere informal discussion of a current problem by individual officers, pointing out that the script has been prepared in the State Department and copies were available to the press in advance of the program.

Russell B. Brown, general counsel of the Independent Petroleum Association of America, said: "I should like to see a radio discussion of this same question between industry representatives who believe in at least making the attempt to discover and develop oil resources at home, and the advocates of a supine dependence on foreign reserves and foreign politicians.

"I would like such discussion to be really extemporaneous, each speaker to be searched for a concealed script as he comes in."

B. A. Hardey, president of IPAA, further decried State Department predictions that the United States would be forced to import more foreign oil.

"It is an easy thing to predict disaster and crisis," Hardey declared. "That has been going on ever since the American oil producing industry began in 1859.

"It is a policy that would force large volumes of imports into our markets, weakening and in time destroying the domestic producing industry.

"I am reluctant to believe that such a policy is consciously intended. Unqualified statements of impending shortage such as were broadcast to the nation do lend support to those who would subordinate our domestic industry to that which exists in foreign countries."

Stripper Subsidies Draft Delays Issuance of Order

Announcement of the rates and conditions for the payment of stripper-well subsidies for the eight months remaining before they terminate April 1, next, was still in the air at the week-end, with Reconversion Director Steelman's office explaining that the delay was in the drafting of the regulations rather than any disagreement between agencies.

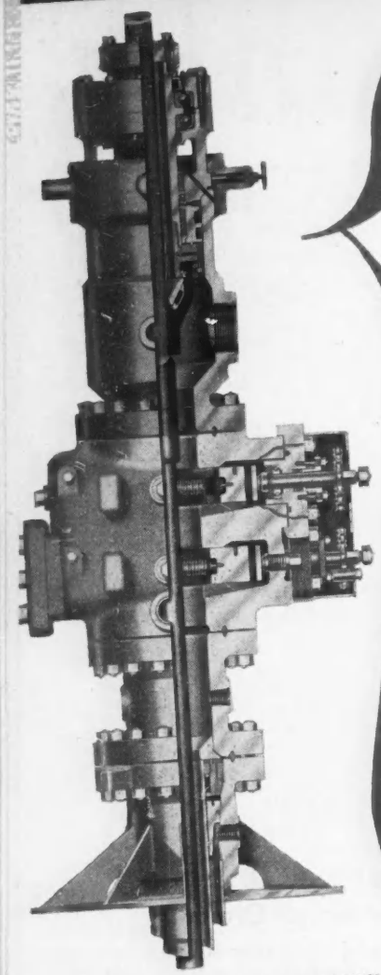
Meanwhile, the Reconstruction Finance Corporation, which handles the subsidy payments, issued new regulations to meet the situation created by the decontrol of oil.

The new regulations provided that claims with respect to the purchase of crude produced from any subsidy area are to be in amounts equal to the number of barrels purchased and paid for multiplied by the excess by which the amount per barrel so paid exceeds either (1) the basic maximum price (the price which could have been charged or paid on June 30 under the ceilings then in effect) or (2) the posted price at the time of purchase, whichever is the higher.

OWMR officials said the subsidy decision would be announced this week, so that the industry would know the conditions under which it would operate for August and in subsequent months.

Key Workers Deferred

The Civilian Production Administration announced last week that it would certify a minimum number of key workers in essential activities, including the production of tetra-ethyl lead, for occupational deferment under selective service, but pointed out that the selective service boards already have been advised that they may defer registrants between



THE IDEAL PRESSURE CONTROL COMBINATION *for all drilling work is the Shaffer Rotating Blow-Out Preventer and Stripper with the Shaffer Double Cellar Control Gate. Gives complete pressure protection whether drill string is in or out of hole!*

IT'S A PREVENTER!

When drilling, this unit maintains constant protection against blowouts or pressure surges. It seals around any unit in the drill string, whether square, hexagonal or octagonal kelly . . . or whether drill pipe, coupling, tool joint or drill collar. Moreover, it maintains this seal constantly and automatically and requires no adjustments to adapt it from one size or shape to another. When pressure is encountered, there's no need to even stop drilling. The stripper rubber keeps the well under complete control while the mud column is weighted to hold the pressure. Flow connections built directly into the unit below the stripper rubber permit this mud conditioning to be done quickly and easily . . . and the unit is so engineered that increased well pressure tends to seal the stripper rubber more securely against the drill string, thus assuring a tighter leak-proof seal.

IT'S A STRIPPER!

As the drill string is raised or lowered in the well, the stripper rubber automatically expands or contracts to maintain a tight continuous seal. It not only maintains its pressure-tight seal around the drill pipe, couplings, tool joints and drill collar . . but it also automatically adapts itself so that a perfect seal is maintained around the kelly, too. In fact, except for such abnormally large diameters as the bit and reamers—it will maintain a perfect seal around any and all elements in ordinarily-used drill string assemblies. Thus, the drill string can be stripped in or out of the well without losing pressure protection at any time!

IT IS SIMPLE!

No special operations are required for running pipe or making connections when drilling with this Shaffer unit. To add pipe you simply raise the drill pipe through the Stripper, add the additional pipe, reconnect the kelly and lower the drill string back in the hole for continued drilling the same as in ordinary drilling work!

IT ROTATES!

In the Shaffer unit—unlike most blowout prevention equipment—there is no wear on the rubber when packed off against the kelly while drilling. The unit is so designed that the stripper rubber rotates with the kelly. This unique advantage not only minimizes wear but also assures maximum pressure protection by providing a uniform seal around the entire circumference of the kelly at all times—a feature not possible where the packing element must becontinually expanding and contracting as the kelly rotates through it. Another unique advantage—there is no driving pressure between the packing element and kelly. The unit is equipped with a floating drive (which is automatically withdrawn with the kelly) that locks the Preventer and the kelly into perfect rotational alignment!

IT RELEASES!

Here's another important feature . . . The internal mechanism is held in place by a Quick Releasing Bonnet which remains permanently on the Preventer body. When it is desired to lift the bit or reamer through the Preventer you simply pull a spring latch, turn the Bonnet 1/8 turn to the left and the complete rotating assembly can be readily withdrawn from the body on top of the bit or reamer. When going back in the hole, the operation is simply reversed. Thus, passing bits and reamers through the Preventer body takes only an instant!

IT'S COMPACT!

Like Shaffer Cellar Control Gates, the Combination Rotating Blow-Out Preventer and Stripper is engineered for maximum compactness. It requires a minimum vertical space in the drilling riser. Not only is the unit itself unusually compact, but flow connections in the body eliminate need for additional equipment in the drilling riser to provide overflow connections. This saves still more space!

The big news in pressure control...

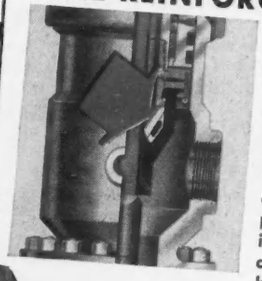
THE SHAFFER *Combination*

Rotating Blow-Out Preventer and Stripper!

Combines in *ONE* Device *EVERY* Desired Pressure Control Feature . . . No Special Equipment Required!

OPERATORS everywhere are talking about the Shaffer Combination Rotating Blow-Out Preventer and Stripper because it combines—*in one unit*—every desired feature for simple, successful pressure control while drilling. It operates with standard kelly and drill string equipment and handles all types of pipe—coupled, upset or flush-joint. Check over its *many* unique features outlined above. And there are still others. Get all the facts from your nearest Shaffer representative—or write direct

STEEL-REINFORCED STRIPPER RUBBER!



Note in this cutaway view how the rubber is backed by flexible steel latches. These form an expandable steel barrier that prevents extrusion when the rubber is subjected to unusually high pressures or mechanical forces. Because this steel barrier reinforces the stripper rubber at all times, large diameters can be pulled through it without difficulty or damage. Also, when abnormally high well pressures occur, although the stripper rubber is squeezed inwardly, it is protected both against damage and against losing its seal by this flexible steel barrier.

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the ages of 19 and 29 who are considered irreplaceable and indispensable to an activity essential to the national existence.

It was indicated that the ruling sent the boards by selective service will be adequate to meet the needs of the oil and other industries.

Vail Steel Tubing Plant Offered Again by WAA

The War Assets Administration last week rejected all offers to purchase the steel tubing plant built during the war in the recently-discovered Vail oil field, California, and invited new bids, separately for the plant and the oil and mineral rights of the property.

WAA officials said that although all bids previously submitted were rejected, the widespread interest shown in the property promoted its re-offer. The plant is expected to participate substantially in the industrial steel expansion of the West and it also is considered an important site for oil development.

Elmer Ellsworth Joins AAPG

Lt. Col. Elmer W. Ellsworth, recently returned from the Pacific war theater, has joined the headquarters staff of the American Association of Petroleum Geologists at Tulsa, and assumed the duties of assistant business manager to J. P. D. Hull, business manager.

Ellsworth, who has degrees in geology from the University of Wisconsin and Stanford University, is the author of several geological papers. Prior to entering the Army, he served as field geologist, geophysicist, and consultant on geological, mining and petroleum problems in various parts of the United States and Canada.

Truman's Comment Slows Up Agency Disposal of Land

Agriculture Department disposals of land slowed down last week as officials studied the implications of President Truman's statement that he "hoped" Congress next year would repeal legislation providing that conveyances of land by government agencies shall include all mineral as well as surface rights. The provision was incorporated in legislation setting up a Farmers Home Corporation in the Department which the President signed reluctantly because of the provision for transfer of sub-surface rights, pointing out the importance of government retention of ownership and control of fissionable material under the Atomic Energy Act.

The largest land-owner in the country, the government in the past has followed a general policy of reserving sub-surface rights when selling properties. The policy has been the subject of controversy for several years.

New U.S.G.S. Maps

Publication of a new chart showing the character, thickness and correlation of the Tertiary beds on the eastern side of the San Juan Basin, New Mexico, was announced last week by USGS.

Although the area has long been regarded as a potential oil and gas section, the possibilities of the Pennsylvanian rocks are practically untested by drilling.

Copies of the chart, Preliminary Chart 24 of the Oil and Gas Investigation series, may be had at 35 cents each from Washington, Denver or Tulsa.

The Survey also has issued a revision of the Structure Contour Map of the Montana Plains, showing for the first time all significant dry holes drilled for oil and gas and the indication of the geologic age of the formation in which such tests were bottomed.

Copies of the map may be purchased at 25 cents each from Washington, Billings, Mont.; Casper, Wyo.; Denver or Tulsa.

Mineral Production From Public Lands Shows Gain

Production of mineral resources from the public lands during the fiscal year ended last June 30 was sharply above that of the preceding year, the U. S. Geological Survey has reported.

The number of leases increased from 7335 at the close of the 1945 fiscal year to 9121 in June, and the acreage covered rose from 4,652,908 to 6,168,438 acres from which petroleum, natural gas, coal and other items were being produced.

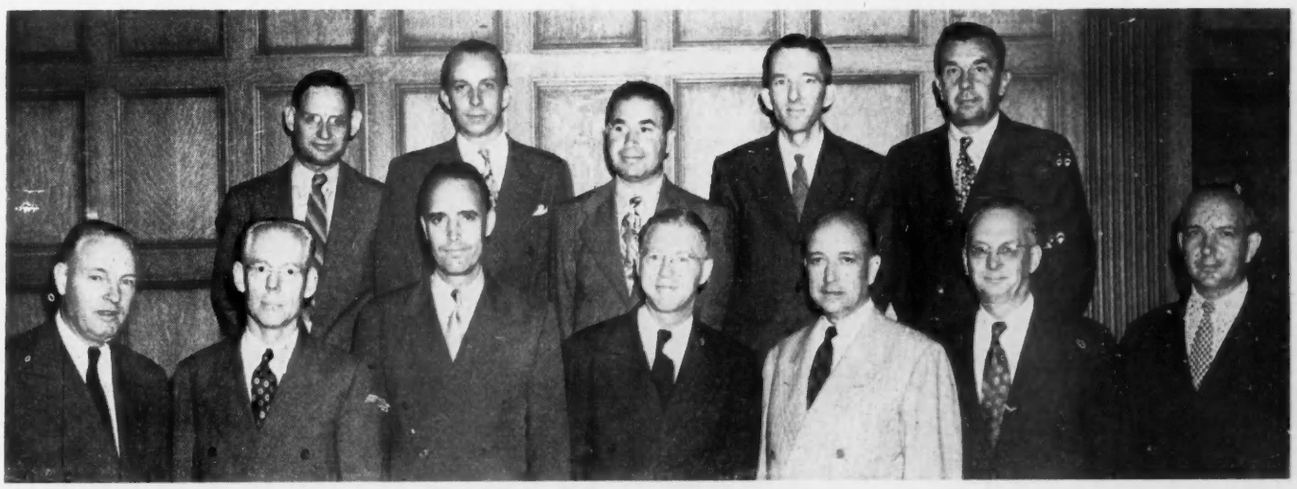
The report showed that the 1946 production included 59,567,525 barrels of petroleum, against 55,907,088 barrels in 1945; 96,070,275 mcf of natural gas against 95,920,557 mcf, and 120,819,733 gallons of gasoline and butane against 127,922,645 gallons.

Had it not been for the end of the war, Director W. E. Wrather said, the increase in petroleum production would have been materially greater.

Petroleum Chemists Meet In Chicago in September

Chemists from the oil industry and technical schools will celebrate the twenty-fifth anniversary of the organization of the Petroleum Division of the American Chemical Society at Chicago during the week of September 9 when the society holds its 110th national meet.

California Natural Gasoline Chairmen



Standing committee chairmen of the California Natural Gasoline Association for the year 1946-47 are pictured above, left to right, as follows: Top row—D. B. Johns, vice chairman, technical committee; P. W. Mettling, chairman, entertainment committee; M. W. Kibre, president and chairman, executive committee; L. Harmon Peahl, secretary, Taft Chapter; F. J. Colton, vice president and chairman advisory committee. Lower row—R. S. Tulin, chairman, gas report committee; C. D. Gard, chairman, finance and budget committee; L. E. Woodruff, chairman, program committee; J. B. Taylor, chairman, by-laws revisions committee; E. G. Ragatz, chairman, fall meeting committee; E. P. Valby, chairman, technical committee, and M. L. Arnold, chairman, publicity committee.

Petroleum Price Control Status Likely Unchanged as Levels Hold

With its first big job—that of deciding whether meats, grains, dairy products and feeds were to go back under price ceilings—the Price Decontrol Board last week cleared the decks for action on other commodities decontrolled by Congress, including petroleum.

The case of petroleum differs from that of the commodities involved in the board's first action, in that in the case of meat and the other products the board was required by the new Price Control Act to decide by August 20 whether they were to go back under control, whereas ceilings may be restored on petroleum only if the board specifically directs.

So far, OPA officials admit, petroleum prices have not risen unreasonably above their June 30 maxima, and there is no shortage of supply.

Observers saw in the board's action on milk and dairy products the attitude it is likely to take toward oil. The board found "some instances" where prices of milk and milk products have exceeded the June 30 ceilings, plus the subsidy, but pointed out that in most cases the excess has been small, although in some it was unreasonable. The decision not to re-impose controls was made despite a finding that the supply of milk will fall short of demand, at least until next spring.

A major factor tending to keep petroleum free is the provision of the act that all price ceilings ordered by OPA must reflect 1940 industry-wide costs of production plus all industry-wide increases occurring since. The oil industry long ago laid conclusive evidence before OPA of increases in costs which justified a 35-cents-per-barrel increase in ceilings, which was refused simply because of the agency's determination to hold the line, although eventually it granted a ten-cent increase with a promise of more at a later date. The increases in price since June 30, it is contended in the industry, merely reflect costs which OPA refused to recognize.

At OPA there were no indications that officials intend at present to do anything more than watch developments in the oil industry, and there has been no intimation that anyone feels that advances in price so far have been unreasonable or inflationary. Thus, since it is up to OPA to initiate any move to re-impose controls on oil, it is not expected that the Price Decontrol Board will get into the petroleum field at this time.

API Production Division Gives Tentative Schedule

A tentative schedule of Production Division committees of the American Petroleum Institute for the annual sessions, Stevens Hotel, Chicago, has been announced. These start as early as Friday, November 8 although API's actual meeting dates are November 11-14. The preliminary schedule is given in order to facilitate procurement of hotel reservations which are being handled by the API Housing Committee, Chicago Convention Bureau, Inc., 33 North LaSalle Street, Chicago 2.

Requests for reservations should show name, company, business address, type accommodations desired, and expected arrival and departure dates. Complete information on this matter may be had from the API's New York office (ask for hotel bulletin issued May 15, 1946.)

Earliest possible requests for reservations are urged.

Tentative plans call for general API sessions on Tuesday evening, November 12, Wednesday afternoon and evening and Thursday morning. Three group sessions are planned for the Division of Production, Tuesday, Wednesday and Thursday afternoons.

Special Train Planned for South Texans Going to API

A special train to the API meeting in Chicago in November will be operated by the Missouri Pacific Lines and the Chicago & Alton, leaving Houston at 2 p.m., Saturday, November 9, and arriving in Chicago about 3 p.m. Sunday. The train, designed to carry all South Texans who plan attending the API sessions, will offer special accommodations in sleeping cars, parlor car and adequate diners, rail officials said.

If there is sufficient demand the MP will have a special car from Houston the previous Friday for those who wish to see the Rice-Arkansas football game in Little Rock November 9. Passengers may occupy the car while in Little Rock and it will be attached Saturday night to the special Chicago train.

Reservations for the special train and also for the special Little Rock car should be made directly with the Missouri Pacific passenger office in downtown Houston.

Fuel Laboratory Closed

Abandonment of plans, at least for the present, to convert part of the Army ordnance plant at Louisiana, Mo., into a demonstration plant for synthetic liquid fuels research program has been announced by the Department of Interior.

Shortly after V-J Day, the Department moved a 25-man planning staff into the Missouri plant to convert it from synthetic ammonia manufacture to production of synthetic gasoline and lubes by coal hydrogenation process. The Army recently announced plans to begin using the plant again for production of nitrate fertilizer for European countries.

Scrap-Pig Iron Shortage Affects Steel Production

Spokesmen for the steel industry warned this week that a substantial reduction in output was imminent as a result of the shortage of pig iron and scrap.

Open-hearth production already is being curtailed because shipments from scrap yards are down at least 50 percent from the early summer and inventories have been depleted at many consuming points, while allocations of pig iron, for housing, agricultural and other preference requirements, also are affecting operations.

Current steel production is at a high rate, but strikes early in the year and the shortage later of scrap and pig iron, has resulted in output for the first seven months of the year being 16 million tons less than the same period in 1945—only 33,928,018 tons against 50,128,635 tons.

Shell Establishes New California Research Unit

Shell Oil Company, Inc., has opened in Los Angeles a new laboratory to study production methods. It will be a link between Shell's research groups at Emeryville, Calif. and Houston in that "the groups established broad lines which seem to offer best results and the Los Angeles laboratory adapts these ideas to California operating conditions. A staff of seven is headed by W. Tempelaar Lietz, senior exploitation engineer with Walter E. Helmick, senior exploitation engineer directing pressure, volume, temperature and thermo-dynamic investigations and John I. Gates, exploitation engineer in charge of chemical studies and core analysis.

New Orleans Industry Men Organize Oil Club

R. L. Keyes of New Orleans, division manager of The Texas Company, has been named president of the recently organized Petroleum Club of New Orleans, other officers being Harold C. Teasdel, vice president of The California Company, vice president; Harry Foriades, treasurer; Dr. Gordon I. Atwater, chief geologist of William Helis Company, treasurer. The directorate also includes C. C. Clifton, Louisiana division superintendent, Humble Oil & Refining Company, H. Grady Meador, division manager, Gulf Refining Company, Reese E. Carter, Lynn Oil Company, Robert L. Humphrey, Oil Well Supply Company, William Helis Jr., Earl Bateman, drilling contractor, and D. T. McIver, general manager, Freeport Sulphur Company.

Kenneth Crandall, President of The California Company, is chairman of the finance committee, and Humphrey is chairman of the house and entertainment committee.

Permanent clubrooms will be opened in the Roosevelt Hotel about October 15. Lear P. Barbarich, assistant secretary, will act as manager.

The resident membership will total 150 and the non-resident 100.

New Oil and Gas Lease Regulations Will Be Explained at Denver Meeting

September 30 and October 1 are the dates set for the discussion of oil and gas lease regulations contained in the O'Mahoney-Hatch bill between Interior Department representatives and oil producers. The meeting, to be in Denver, was originally slated for September 25.

Lease-holders and prospective lessees thus will have a chance to confer on government proposals designed to carry out provisions of the new law.

Under that act, discoverers of new oil and gas deposits on the public lands are to pay a flat 12½ percent royalty, increases the maximum acreage which may be held and amends the administrative provisions of the 1920 law in several respects.

Meanwhile, regulations were issued by Assistant Secretary C. Girard Davidson last week outlining the functions of the U. S. Geological Survey and the new Bureau of Land Management created by the President's merger of the General Land Office and Grazing Service.

The Geological Survey is given the responsibility of determining the boundaries of a participating area under a unitization agreement executed under the leasing law, and the director is given authority to approve requests for change of operator, subject to the right of appeal to the Secretary. The director also is authorized to act on applications for royalty benefits under the O'Mahoney Act of 1942, by reason of a claimed discovery of a new oil and gas field, and shall determine whether a new field has been discovered, and the date of the discovery.

The director of the Bureau of Land Management is authorized to act without obtaining secretarial approval, unless the Secretary determines otherwise in any particular matter, but subject in any event to an appeal to the Secretary, on applications for noncompetitive oil and gas leases, including their issuance, consolidation, modification, revocation and cancellation.

Similarly, the director is given authority to act on the issuance, consolidation, modification, revocation and cancellation of applications for oil and gas renewal leases and exchange leases; the offering of units for competitive oil and gas leasing under Section 17 of the Mineral Leasing Act; the approval of all bonds filed in connection with oil and gas leases, including collective bonds; assignments of leases or royalty interests, operating agreements and assignments thereof, and subleases, and other matters connected with oil and gas leasing.

THE OIL MAN'S CALENDAR

SEPT.	
9–13	American Chemical Society, Including Petroleum Division, Annual Meeting, Chicago.
10–12	Pacific Coast Gas Association, Annual Convention, San Francisco, Fairmont Hotel.
18–20	National Petroleum Association annual meeting, Atlantic City, Hotel Traymore.
18–20	Oklahoma Liquefied Petroleum Gas Association Annual Convention, Oklahoma, City, Skirvin Hotel.
20	Gas Division, Oklahoma Utilities Association, Annual Fall Meeting, Biltmore Hotel, Oklahoma City.
25	API Directors Meeting, New York, Carlton Hotel.
26	National Petroleum Council, Washington.
OCT.	
1– 2	American Association of Oilwell Drilling Contractors, Annual Meeting, San Antonio, Plaza Hotel.
3– 5	AIME, Petroleum Division, Annual Meeting, Galveston, Hotel Galvez.
7– 9	American Society of Mechanical Engineers, National Conference, Mayo Hotel, Tulsa.
11	California Natural Gasoline Association Annual Fall Meeting, Los Angeles.
7–12	American Gas Association, Annual Convention, Atlantic City, N. J.
16–18	Texas Mid-Continent Oil and Gas Association, Houston, Rice Hotel.
24–25	AIME, Petroleum Division, Annual Meeting, Los Angeles, Ambassador Hotel.
24–25	American Association of Petroleum Geologists, Mid-Year Meeting, Biloxi, Mississippi, Buena Vista Hotel.
28–30	Independent Petroleum Association of America, Annual Meeting Fort Worth.
NOV.	
11–14	American Petroleum Institute, Annual Meeting, Chicago, Stevens Hotel.
21–23	Rocky Mountain Oil and Gas Association, Annual Meeting, Denver, Shirley-Savoy Hotel.

Field Geologic Structures Defined in Survey Bulletin

The U. S. Geological Survey last week announced a list of definitions of the known geologic structures of producing oil and gas fields, issued in effectuation of the purposes of Section 17 of the Mineral Leasing Act, in California, Colorado, Kansas, Montana, New Mexico, North Dakota, Oklahoma, Utah and Wyoming.

The fields range in size from the 40-acre Tonto field in New Mexico, added to the list last November 20, to the 2,224,484-acre Hugoton field in Kansas and Oklahoma, as defined September 5, 1945.

MER Changes Considered

Substantial changes in present rates of production were recommended for 35 Texas oil fields at MER hearings held before the Texas Railroad Commission last week.

Rates in the Avoca field of District 7-B and in the Todd Deep field of District 7-C would be changed if recommendations are followed. In District 8, changes were sought for the following fields: Abell, Bedford Ellenburger, Cedar Lake, North Cowden, North Cowden Deep, Emperor, Fort Stockton, Foster, Fullerton (8500 feet), Fullerton Ellenburger, Garza, Goldsmith, Halley, Keystone Ellenberger, Landon, Means, Midland Farms, Monahans Ellenberger, Monahans Clearfork, Monahans Permian, Ownby, Sand Hills Tubb, Seminole, Slaughter, T.X.L. Devonian, T.X.L. Ellenburger, Waddell, North Ward Estes, Wasson, Welsh, Wheeler Ellenburger, Wheeler Devonian, and Yates.

Stanolind's Safety Record Earns Honor Certificates

Stanolind Oil & Gas Company has been awarded six Certificates of Honor by the Joseph A. Holmes Safety Association for outstanding safety records established during recent years. The association is comprised of several national organizations of the mining, metallurgical and allied industries and commemorates the efforts of Dr. Joseph A. Holmes, first director of the Bureau of Mines, to reduce accidents and ill health in these industries.

Stanolind received an award covering company-wide operations for having operated a period of seven years with an exposure of 59,127,696 man-hours worked with an accident frequency rate of 6.66.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED August 24	August 17
Alabama	1,150	1,150
Arkansas	73,950	73,700
California	880,800	877,000
Colorado	39,500	37,750
Florida	200	200
Illinois	203,800	204,050
Indiana	17,750	17,900
Kansas	274,900	277,450
Kentucky	30,850	31,200
Louisiana	387,750	387,200
North Louisiana	83,950	83,400
South Louisiana	303,800	303,800
Michigan	47,050	47,650
Mississippi	76,800	71,650
Missouri	100	100
Montana	24,550	24,600
Nebraska	700	750
New Mexico	100,900	101,300
New York	14,050	13,750
Ohio	8,050	7,950
Oklahoma	384,600	383,550
Pennsylvania	36,850	36,150
Tennessee	35	35
Texas	2,119,800	2,119,800
Tex. R. R. Comm. Districts:		
Dist. 1. S. Central	19,500	19,500
Dist. 2. Lwr. Gulf Coast	155,100	155,100
Dist. 3. Upr. Gulf Coast	486,550	486,550
Dist. 4. S. West	224,300	224,300
Dist. 5. E. Central	43,050	43,050
Dist. 6. E. Texas Field	317,000	317,000
Dist. 6. Rest of N. East	105,650	105,650
Dist. 7-B W. Central	32,650	32,650
Dist. 7-C West	27,900	27,900
Dist. 8. West	490,600	490,600
Dist. 9. N. Central	132,700	132,700
Dist. 10. Panhandle	84,800	84,800
West Virginia	8,100	7,500
Wyoming	112,850	111,500
Total United States	4,845,085	4,833,885

Total stocks, foreign and domestic August 17, as reported by the Bureau of Mines were 225,583,000 barrels with a daily average production of 4,843,000 and runs to stills 4,907,000.

First Gasoline Through Humble's Coast-to-North-Texas Pipe Line

Humble Oil & Refining Company has completed and placed into operation its $4 million products line from its Baytown refinery to a North Texas terminal between Fort Worth and Dallas. The first load of gasoline through the 8-inch, 275-mile line reached the northern terminal last week-end.

The carrier will have a daily delivery rate of about 15,000 barrels with pump stations at Baytown and Hearne.

A new method of construction was used on the section between Hearne and Fort Worth-Dallas. A new coating and wrapping machine applied a coat of molten enamel and a spiral wrap of fiberglas on the clean pipe in one continuous operation.

Contractors on the line were France Construction Company of Corpus Christi and O. R. Smith Construction Company of Fort Worth.

This is the first of possibly several such products lines projected from Texas Gulf Coast refineries to inland terminals. The Texas Pipe Line Company and Magnolia Pipe Line Company from the Langsdale field (Mississippi), already have announced plans for a $10 million joint carrier from Beaumont-Port Arthur refinery district to Fort Worth-Dallas.

Sinclair Refining Company also is credited with planning to lay a products line from its refinery at Corpus Christi to the Austin-San Antonio area.

Barber Asphalt Plant to Get Oil from Gulf Coast

Standard Oil Company of California is to divert 10,000 barrels daily of its production developed by The California Company, a subsidiary, in Mississippi and South Louisiana to the Barber Asphalt Company's New Jersey refinery as result of its recent acquisition of an interest in the latter firm.

The California Company is currently producing 30,000 barrels daily in the two coastal districts, with the Cranfield field (Mississippi), yielding 10,500 barrels daily. Heretofore The California Company has disposed of its production on the open market, and for the time being must rely upon the pipe line transportation and tanker loading facilities of others to make deliveries to the East Coast asphalt plant.

Production in the Baxterville field has been boosted to 8000 barrels daily as result of Gulf Refining Company having placed in operation its 14-inch relay line from the field to a tank car rack at Lumberton, Miss.

This oil is consigned to its Port Arthur, Texas, refinery and represents the first market outlet for the 23-well field as previous sales of the 17-gravity oil were restricted to fuel sales to drilling rigs. The field has been assigned a top allowable of 425 barrels daily per well, but all wells are not capable of this output.

The Warrior River Asphalt Company, owned by the H. L. Hunt interests of Dallas is scheduled to start trial runs about September 1 at its 3000-barrel daily capacity asphalt refinery near Tuscaloosa, Ala. This plant will be supplied with 18-gravity crude from the nearby Gilbertown field (Alabama) and also

Anderson Heads Special Corrosion Study Group

Efforts to form an inter-industry committee to improve procedures for handling problems arising from cathodic protection of pipe lines, communications cables, railroad signal systems, and other buried structures was initiated rerecently at St. Louis by representatives of seven interested industry associations and industries. Included were American Association of Railroads; American Gas Association, American Petroleum Institute, American Water Works Association, Bell System, Western Union Telegraph Company, and the National Association of Corrosion Engineers. The American Transit Association was represented by an observer.

The meeting was initiated by the API pipe line group. H. H. Anderson of Houston, vice president of Shell Pipe Line Corporation, was elected chairman of the committee.

Working under the title "Correlating Committee on Cathodic Protection" the group proposes to undertake a program of education and assistance to be accomplished through the preparation of general and technical bulletins.

TGT Lets Contract For First Spread of New Loop

Tennessee Gas & Transmission Company has awarded contract to Morrison Brothers Construction Company of Odessa, Texas, for the laying of 20 to 30 miles of 26-inch loop on its natural gas pipe line in the states of Louisiana and Arkansas.

Work on the job, part of TGT's $29½ million expansion program, is due to begin in September. This is the first spread to be let on 410 miles of 26-inch loop.

The loop, together with 18 new compressor units and 3 new compressor stations, will increase the gas pipe line's capacity about 40 percent, of which three-fourths of the increase is expected to be taken up by waste gas.

Pipe Liners Reunion

C. Hobson Dunn, president of the Eastern Construction Company, Inc., Dallas, was host of the pipe liners reunion recently at his D Bar Ranch, 50 miles north of Fort Worth. Honor guest was Allen "Dad" Dunn, celebrating his 89th birthday.

The 1000 guests represented both major and independent companies.

Tentative Studies Made For New Rangely Outlet

Although no definite action has been taken, tentative studies have been made by Standard Oil Company of California for the construction of a pipe line from the Rangely field, Rio Blanco County, Colorado, to southern California, officials declared. Colorado had heard rumors last week that the company shortly would make announcement of plans.

The California firm has more than 50 percent of the production in the field. Present Rangely marketing is handled by a Stanolind pipe line with a total capacity of 32,000 barrels daily connecting with the Utah Pipe Line system at Wamsutter, Wyo., where the crude is moved east to Casper, Cheyenne and Denver refineries, and west into Salt Lake City.

There are now 102 wells producing in the Rangely field, and for the last half of August the pre-well allotment made by the purchasing company—Stanolind Pipe Line Company—is at the rate of 250 barrels daily. An estimated 60,000 barrels daily will be produced with further field development.

Hobson Dunn Is Head Of Reorganized Company

C. Hobson Dunn has been named president of Eastern Construction Company, Inc., of Dallas, recently organized to take over the activities of Eastern Construction Company, an unincorporated firm. Other officers are J. W. Hall, vice president, and Miss E. A. Anderson, secretary-treasurer.

New projects recently contracted by the company include 60 miles of 8-inch line between Wilmar and Alexandria, Minn., for Great Lakes Pipe Line Company, and part of the 8-inch line being constructed by Standard Oil Company (Indiana) between Whiting, Ind., and Morehead, Minn. D. C. Cloud is in charge of right-of-way work on the Great Lakes project while Luther Liggett is preparing right-of-way on the Standard job.

McGowen, Boyer Named

N. C. McGowen, of Shreveport, president of United Gas Company, has been appointed by Gov. Jimmie H. Davis of Louisiana as one of a 12-member board of directors for the Louisiana Department of Commerce and Industry. He will represent the natural gas interests.

Marion W. Boyer, vice president and general manager of Standard Oil Company of New Jersey at Baton Rouge, was appointed as representative of the petroleum and chemical industries.

Virginia Line OK'd

The FPC has authorized Virginia Gas Transmission Company to construct a 30-mile, 6-inch pipe line from Lexington to Lynchburg, Va., and to build a 1600-horsepower compressor station in Greene County and an additional 800-horsepower compressing unit at its Gala station, to supply natural gas to Lynchburg, and more gas to Washington.

Spring Hill 3 Test Commenced by Chile

The Chilean Company for the Development of Production (Corporation de Fomento de la Produccion) announces that drilling has begun on its Spring Hill 3 well on Isla Grande, Tierra del Fuego, 6 miles from the north end of the Straits of Magellan.

Spring Hill 2 was completed as a dry hole at more than 10,000 feet in July, and all equipment moved to the No. 3 site which is an offset to Spring Hill 1, first wildcat test and current producer, "farthest south" oil discovery in the world.

Spring Hill 1 has never been fully completed, due to lack of a market for the crude. It is opened up occasionally and the oil used for road-building purposes. Consequently, nothing definite is yet known about its rate of flow, but most recent guesses are that it might produce 1500 barrels a day.

Work on Chile's Pecket 1 is proceeding slowly. This wildcat is located on the Brunswick Peninsula, north and west of Spring Hill locations. Pecket 1 is a cable tool test in the foothill section, and excessively difficult transportation is delaying drilling.

Far East Oil Production Gains as Repairs Effected

Repairs carried out at the Shell Group's oil installations in Borneo have made possible the handling since the resumption of operations of 16,500 tons (about 128,452 barrels) of petroleum at Balikpapan and 18,000 tons (about 139,-130 barrels) at Tarakan during the year since the Japanese surrender.

Haiti Imports

Haiti imported 29,432 barrels of gasoline from October, 1945, through March, 1946, the first six months of the fiscal year. In the corresponding period of 1944-45, 25,176 barrels were imported.

Personal Mention

Hubert Ferry, H. E. Giles and **C. S.** Perkins compose a committee now in charge of Union Oil Company's exploratory operations in Paraguay, following the resignation of Ted Miles as manager of foreign operations.

»

Carroll Cook, geologist for Standard Oil Company (New Jersey) has returned to the U. S. after five months in Peru. He will be located in the geological department of the company's New York office.

»

O. A. Seager, assistant manager for Standard Oil Company of Egypt, has arrived from Cairo. Formerly a geologist with The Carter Oil Company, he is spending a six months' leave at his Billings, Mont., home.

New Venezuelan Highway Reported Fourth Complete

The $9 million highway being built by 11 oil companies in Venezuela is one-quarter finished. This highway will be 200 miles long, and will extend from El Sombrero in Guarico to the port of Guanta on the Caribbean. Principal object of the road is to carry materials for exploration work now going on in new concessions located in Guarico and Anzoategui, but it will also be a public road.

The oil companies will bear all the costs in return for concessions granted by the two states.

Shell Union Oil Elects Legh-Jones As Chairman

George Legh-Jones has been named chairman of the board of Shell Union Oil Corporation at a recent directors meeting. Legh-Jones, at present a managing director of Shell Transport and Trading Company, was for many years president of Shell Oil Company in San Francisco and has been on the board of Shell Union since 1925.

George Legh-Jones

Sir Frederick Godber, who resigned as Shell Union director has been a member since 1922 and chairman since 1937. He was at one time president of Shell Petroleum Corporation, St. Louis.

Frank J. Hopwood, who until recently was president of Asiatic Petroleum Corporation, New York, and now a managing director of Shell Transport and Trading Company, was named to the board to fill the Godber vacancy.

1945 Iran Production

Production of crude oil in Iran in 1945 amounted to 16,839,490 tons (about 118 million barrels), an increase of 3500 tons (about 25,000 barrels) over the previous year's total and a record in the history of the company, Sir Robert Waley Cohen, chairman of the board, said recently.

Production in English oil fields and in the Scottish shale industry recorded declined during 1945, he said.

The company's British tanker fleet increased during the year from 69 vessels of 753,000 tons to 82 vessels of 899,000 tons with 1 million tons the 1946 goal.

Miri Explorations

Governor General Malcolm MacDonald of Singapore recently concluded a tour of Sarawak, on the island of Borneo, and reported that oil fields in Sarawak and Brunei may become "the most important in the British Empire." He reported that a British-Dutch subsidiary of Shell Oil Company was making explorations in the Miri area.

And Don't Forget The "Tailpiece"!

The Army disclosed last week that it has found a way of testing an armored jacket developed by the Quartermaster Corps too late to be put into production for the war.

The happy "guinea pigs" will be an 18-man scientific and drill crew party prospecting for oil in the jungles of Colombia in an area never before penetrated by white man, where the Indians are said to be unerring markesmen with the bow and arrow.

The crew is being sent out by an American-operated oil company, many of whose employes are said to have been killed or wounded by savage tribesmen in the past several months.

The 18 men will wear the quartermaster jackets which are fitted with protective panels of Doron armor, made of glass-filament laminated plastic that repels missels up to and including a .45-calibre revolver bullet. Since oil exploration involves much bending over, the jackets will be supplemented by a special "tailpiece" containing six plates of the armor, suspended at an appropriate point.

Pipe Line to Help Move Oil from Lake Maracaibo

The Creole Petroleum Corporation's new 60,000-barrel daily refinery, to be constructed on Paraguana Peninsula on the shore of Amuay Bay in Western Venezuela, will be served by a pipe line from the large producing fields on Lake Maracaibo.

Although actual work has not yet started on the proposed $65 million plant, much of the material has been ordered and work probably will begin before January 1.

The proposed pipe line will originate at the company's Rio Ule tank farm and terminate at the Bay of Amuay, near the refinery site. This means much more flexibility in the transportation system for the next few years, since the line can carry oil, not only to supply the refinery, but for shipment by ocean tanker. Under the present system, the oil is moved from the lake fields first by shallow-draft lake tankers and then reloaded for final shipment.

Cost of the pipe line, not yet announced, is estimated to be between $10 million and $12 million. It is to be a combination of 26-inch and 24-inch pipe with two pump stations and some 250 kilometers (about 155 miles) in length. The designed capacity is 280,000 barrels daily.

Creole's production from the Lake area is being continuously expanded by development of the lake-bed areas, and it is possible that in future years the pipe line will be urgently needed to augment the tanker fleet. At the present, the company is producing and moving 430,000 barrels of oil daily in Western Venezuela.

Geology Applied to Petroleum

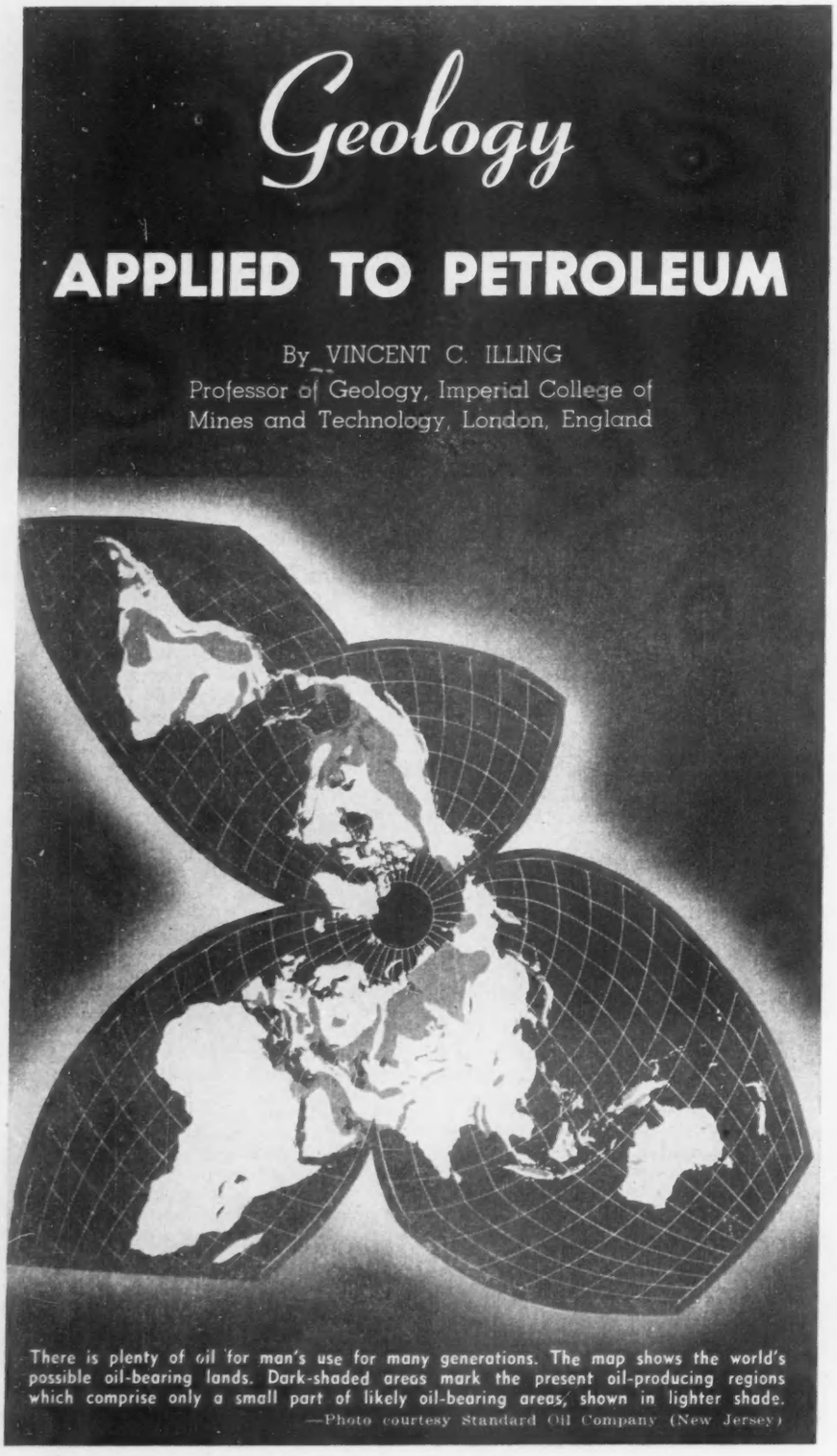
By VINCENT C. ILLING
Professor of Geology, Imperial College of Mines and Technology, London, England

Part 2

Types of Regional Structure

Oil Fields in Regions of Horizontal Rocks

IT HAS been stated that the anticlinal theory of oil accumulation, though applied at an early date to the Pennsylvania, fields, was not really applicable to this region. It is true that as White notes there was a tendency for the gas to accumulate above the oil, but apart from the Volcano Burning Springs Anticline of Virginia, there are few instances to support this theory. Indeed, the structure of the Pennsylvanian Basin where the oil fields occur is one of nature's nearest approaches to horizontality, and the factors which decide oil accumulations are primarily the position of the coarser zones within the fine sands. It is, therefore, not surprising, when we review the conditions, that in these older fields of the United States the role of geologist in oil discovery was not in any way an important one. Most of the pools were discovered by haphazard wildcatting. They were developed from the original discovery wells by competitive drilling and the finally demarcated fields owe little to structure, their boundaries being mainly the edges of the coarse sand streaks. There are some exceptions to this, particularly where the coarse sand streaks were too large to be filled by the available oil and gas. In these cases we note that the lower edge waters tend to follow the lines of structure.



There is plenty of oil for man's use for many generations. The map shows the world's possible oil-bearing lands. Dark-shaded areas mark the present oil-producing regions which comprise only a small part of likely oil-bearing areas, shown in lighter shade.
—Photo courtesy Standard Oil Company (New Jersey)

Oil Fields in Areas of Gently Inclined Rocks

The earlier part of the present century saw a great expansion in exploratory work for new oil fields. So far as the areas outside the United States are concerned, these developments followed in the main the lines of the Tertiary mountain building movements, and the oil fields so discovered were mostly in folded rocks where the anticlinal theory was the principal one on which discoveries were made. In the United States itself, apart from California and the Rocky Mountains, the development of geological theory was on different, though parallel lines, largely because the structures in which drilling was done were of a different nature. These differences will be considered in a later section, but it may be of interest to point out at this stage that in areas like the North Oklahoma and Kansas region, where the regional structure was a simple monocline, geologists soon came to realize that an oil accumulation could be caused by any slight reversal in the regional dip, which, though not an anticline, produced locally a condition similar to that of an anticlinal crest. Such structures were the monoclinal domes which in the case of Eldorado (Kansas), Cushing and Oklahoma City, formed large accumulations of petroleum.

Trapping of Oil

The discovery of such oil pool structures could not fail to suggest the idea that they were due to the trapping of oil in a process of migration rather than the static separation of gas and oil over water which had hitherto been the basis of the anticlinal idea. In the case of Cushing (Figure 2) with its asymmetrical development of oil and gas, with a far greater concentration on the western side than the east, Beall came to the conclusion that each of the three sands on the monoclinal dome of Cushing had been filled with oil and gas by migratory movements of these materials from the basin to the west.[5]

It was not long before it was found that other features in addition to monoclinal domes might prove efficient traps along the lines of migration. In some cases as in the Glenn pool the accumulation appeared to be due to nothing more than the gradual pinching out of the sand body.[6] In others, such as Oklahoma City, faulting appeared to be the cause of accumulation; the fractured end of the porous horizon plastered with impervious formations being as good a trap as any sand lens.[7]

As drilling proceeded in this main re-

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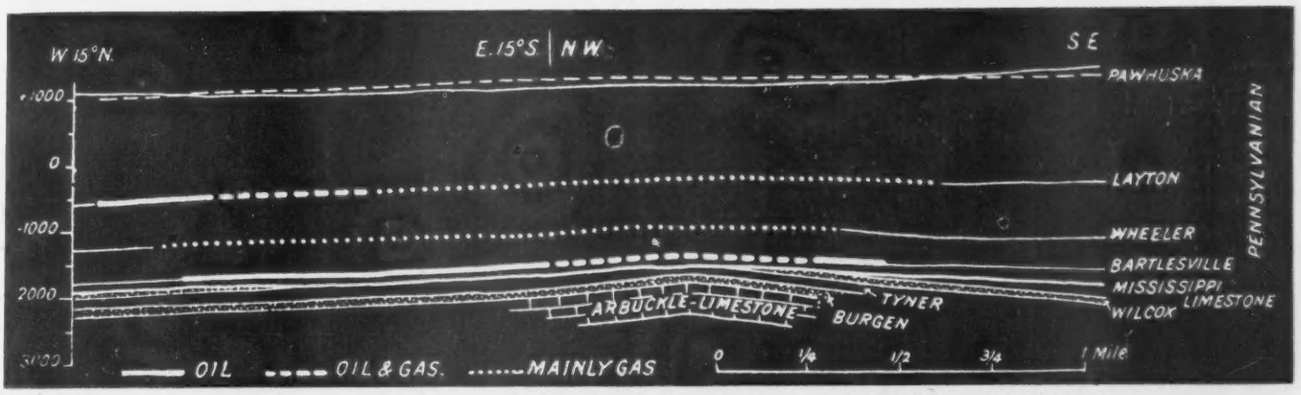


Figure 2. Cross-section through the Shamrock Dome of the Cushing oil field (based on the data of C. H. Beal and T. E. Weirich). The structure is a monoclinal dome on a general regional dip slope to the west. The dome structure in the Pennsylvanian rocks is developed over a buried hill of Ordovician, Silurian, Devonian and Lower Carboniferous rocks, folded into an anticline. The oil and gas accumulations are asymmetrical. Most of the oil lies on the western side and appears to have been trapped there as the oil and gas were migrating up-dip from west to east. Gas and oil are also found below the unconformity, particularly in the Wilcox sand near the crest of the structure.

gion it was, however, seen that the earlier conceptions had been too simple and the deeper drilling into the basement below some of these monoclinal domes revealed interesting sub-structures on which these domes had been developed. These suggested that a partial cause of the dome structure above was the fact that the sediments had been deposited on buried hills in the old "Pennsylvanian" sea floor, and that differential compaction had caused the reversal in the dip.

The discovery of oil in the "Pre-Pennsylvanian" formations, notably in such cases as Cushing, Eldorado and Oklahoma City, immediately raised the problem whether the oil accumulations found in such structures were due to the anticlinal conditions below the unconformity or to the gentle monoclinal structure above. The trend of such lines of thought automatically directed the attention of geologists away from the idea of an oil accumulation due to a static segregation of gas, oil and water in place and into a channel of thought wherein the accumulation was considered as an event in the migratory movements of gas, oil and water, which was part and parcel of the whole sedimentary cycle over a broad period of geological time.

Sedimentation

Thus it is seen that in some of these more simple geological areas (simple, that is to say, in their regional structure), the more the conditions of oil were studied the more it was noted that the accumulations were intimately bound up with the processes of sedimentation and that these processes themselves were closely governed by the structural conditions within the area. This general feature cannot be too strongly emphasized, for though it is true these lessons have been learned from regions like Oklahoma and Texas it is nonetheless true that they can be applied with equal value to many folded areas.

The Glenn pool, noted above, was an early example of the pinching out of a sand by slight changes in the condition of deposition near an old shore-line, but perhaps our finest examples of the way in which simple lithological changes could produce large structural accumulations is in the wedging of the various sand bodies against unconformities. The Midway-Sunset pool in California (Figure 3), one of the largest oil fields in the world, is an example of this condition.[9] Such unconformities act two ways. Firstly they lead to the truncation of the sand bodies and their envelopment by shale, either by overlap or overstep, and secondly they lead to the intimate contact of sand reservoir rocks with clayey source rocks whereby the sand zones absorb the oil as it is squeezed from the clay in the processes of compaction. The oil pool of East Texas (Figures 4-5) is perhaps the classic example of a single sand body, the Woodbine sand, truncated by the overlap of the overlying shales and forming a perfect trap for oil.[9] In this case it is interesting to note that a careful study of palaeogeography of this region would have indicated the possibility of the wedging out of the Woodbine sand along the edge of the Sabine Uplift in the general region where the field was ultimately discovered.

Such accumulations of oil along old shore lines were noted very early in the development of the theories of oil accumulation; indeed, T. O. Bosworth[10] instanced the example of Maikop as an accumulation of this type, but it remained to Levorsen[11] to develop to the full the fundamental geological studies which will have to be made in the future if we are to make the fullest use of this line of attack. By a careful study of the well logs in the United States, Levorsen has built up a succession of pictures of the palaeogeology at different periods of time and has insisted that future search for some of these unconformity fields can and will be guided by such studies.

Valuable Clues

There is little doubt that the conditions of sedimentation form an exceedingly valuable clue to the general position of the major oil pools and when all other structures have been exhausted the geologist will have to utilize such considerations in directing future exploration in spite of the fact that it may involve a large initial number of failures before the sand lenses are discovered.

In certain portions of Kansas and

Figure 3. Cross-section through the Midway-Sunset oil field (after G. S. Rogers, with additions). The oil accumulations are concentrated along the zone of unconformity. Those on the west are entirely due to conditions of overlap and overstep and to local lenticularity. Under the Buena Vista Hills the structure is anticlinal, but the oil accumulations are still concentrated near the zone of unconformity, suggesting derivation of oil from the underlying Maricopa beds.

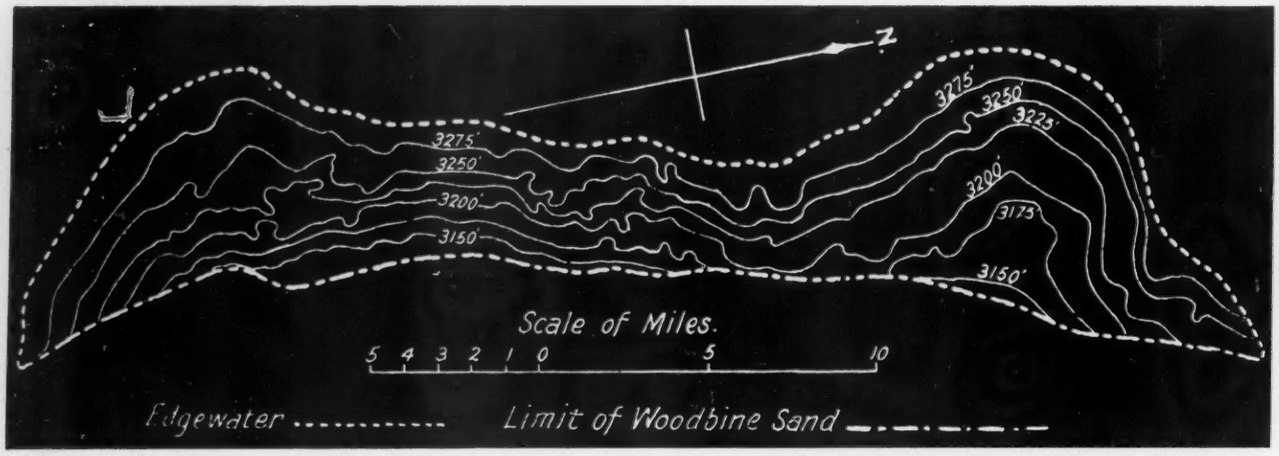


Figure 4. Stratum contour map of the East Texas oil field. The contours are drawn on the basal Austin chalk conglomerate and show depths below sea level (after H. E. Minor and M. A. Hanna). The western boundary of the production in the Woodbine sand is the edge-water zone, which is obviously parallel to the stratum contour system. The eastern boundary is due to the pinching out of the sand by overlap along the unconformity above the Georgetown.

Oklahoma large numbers of small oil pools have been found in a series of scattered lenses often arranged in a longitudinal direction. These "shoestrings," as they are called, were at one time considered to be probably buried rivers as the edges of the sand lenses were so abrupt. It is more probable, however, that they represent channels cut into the clayey deposits by marine currents and infilled with the sand which was being transported in the water.

This brief, and by no means exhaustive, account of the more important features which have led to the development of oil accumulations in regions of simple and gentle dip are sufficient to indicate the complexity of the factors which led to the development of the pools. Simple dome-like conditions are the exception rather than the rule. Where they occur they often give accumulations; but equally successful traps are provided by the conditions of deposition and by such factors as faulting.

Called Useful Suggestion

The essential for all such accumulations is that some lithological or structural feature should trap the gas and oil in its upward passage. In the expressive language of the oil geologist, the areas within the traps in which the oil could accumulate have been termed "areas of closure" and the broader zones down dip from which the oil could have migrated into the structure are the "gathering grounds." This idea that an oil accumulation is the direct result of migration from the area immediately down dip is not accepted by all oil geologists, but it is certainly a useful suggestion, and we see it in its fullest expression in the theory of Hewitt and Lupton[12] applied to the Bighorn Basin. Their conception was that the gas and oil had originated mainly in the shale bodies within the basin and had migrated shorewards to be trapped in the first anticlines which they encountered, i.e., the first rim anticlines on the edge of the basin. It was only the excess oil beyond that necessary to fill the first anticlines which could extend into the next group of folds. On the other hand, the second or third group of anticlines might receive oil should they not lie in the shadow of anticlines in the primary row. This exceedingly attractive theory of regional oil migration, which for the first time suggested that some anticlines might be more favorably placed than others, is an expression of the same underlying idea that a trap can only receive oil if it lies athwart a zone of oil migration and secondly that the quantity of oil it accumulates depends upon the area and thickness of the source rocks with which it is in contact.

Oil Fields in Folded Strata

The factors which have caused oil accumulation in horizontal and gently inclined rocks have already been sketched out and the author has attempted to show that where the structural conditions are relatively simple, small deviations from the otherwise uniform structure become important oil and gas traps. Where, however, the earth's strata have been folded into well developed anticlines and synclines it is obvious that the effect of structure must become clearer and more definite. There never would have been any possibility of doubting the truth of the anticlinal theory in such areas as California, the Andean Chain, the Carpathians, the Caucasus, Persia, Burma, etc. The well-developed inclination of the rocks gives ample scope for the migration of the gas and oil to the highest portions of the crestal zone and in such regions the anticlinal theory becomes the main pivot of geological attack.

Danger In Theory

However, it is illogical to suppose that other structural and lithological features which play an important part where the beds are only slightly disturbed will not also have an influence on oil accumulation, even when the rocks are folded. The very truth of the anticlinal theory has involved a serious danger that the geologist, inclining to accept it so implicitly, fails to realize that it must be adapted to local conditions. It has always been recognized that in the simple anticline the gas, if there be any gas, tends to accumulate on the highest portion of the crest, i.e., the domes. It is surrounded by a zone of oil and the salt waters occupy the lower parts of the structure. Thus only the

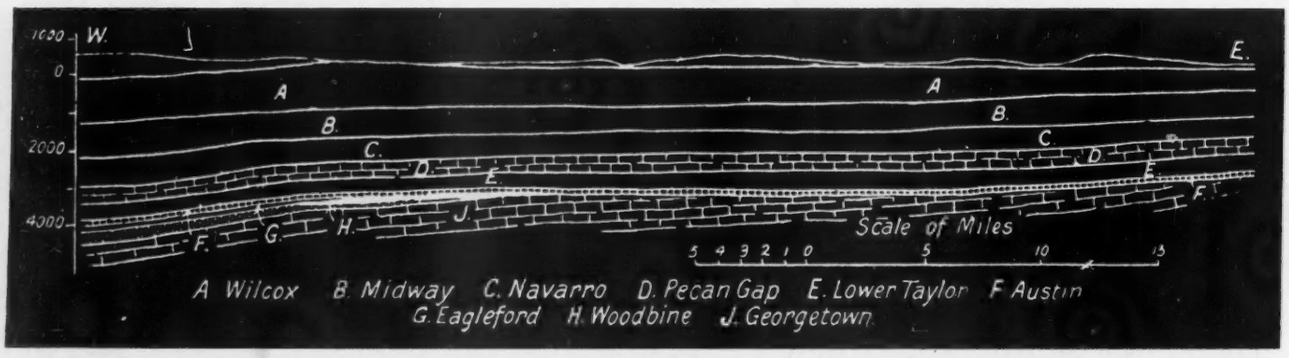


Figure 5. Cross-section of the East Texas oil field (after W. C. Thompson). The East Texas field owes its occurrence to the overlap of the Woodbine sand by the Eagleford and Austin. The oil migrated updip from the west and was trapped at the eastern margin of the sand body.

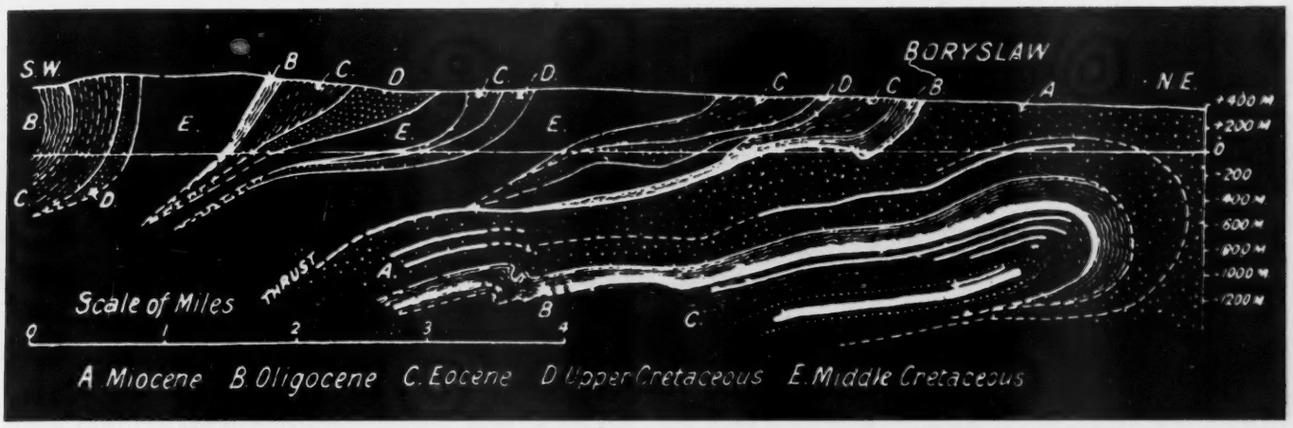


Figure 6. Cross-section through the Boryslaw region of Poland (after K. Tolwinski). The oil accumulation in the recumbent fold of Oligocene rocks lies under a great overthrust. It has been preserved, in spite of the intensely disturbed structure, by the highly plastic nature of the Miocene caprocks.

dome tends to be oil and gas bearing, whereas the saddles and the flanks are likely to hold salt water.

Where the folds are asymmetrical it is generally found that the oil pools are developed on the gentler flank. This is probably an effect of the broader area on such a flank which will lie at favorable levels for oil and gas to be stored; also it is due to the structural factor that as the axial plane dips toward the gentler flank, wells which are drilled to the deeper horizons must automatically start on the gentler side of the fold, otherwise they risk penetrating the syncline contiguous to the steep flank. In regions where the folding is steep and angular it is the general experience that the oil tends to accumulate in a narrow belt close to the crest of the fold. One explanation of these narrow accumulations is that as the wave lengths and therefore the flanks of such folds are usually small the accumulations from such limited gathering grounds are bound to be small also. Furthermore, the angular crestal regions of such folds are usually fractured and the induced porosity limited to the crestal zone gives ample scope for accumulation.

Faulting's Role

These general features of anticlinal accumulations obviously need considerable modification when the sands or other reservoir rocks involved in the folding are of limited extent. In fact, where the sand lenses are small compared with the total wave lengths of the fold the anticlinal theory is hardly practicable. In such cases migration is concentrated in the sand bodies and the oil and gas merely accumulates in the highest portion of each sand lens irrespective of whether it is in an anticline or syncline. In such cases the synclinal areas can become productive and the only feature in which the syncline can differ from the anticline is the depth of the drilling and the associated gas and oil pressures. Faulting plays an important part also in the demarcation of the oil and gas zones on anticlines. Not only does it segment reservoir rocks into different compartments, each of which may contain its own gas and oil accumulation, but such faults often play an important part in transformational migration of oil. The gas, oil and water appear to circulate partly within the porous rocks and partly along the fissure planes associated with the faults. The general result of such migration is to create a number of separate pools on the general fold; each of the pools being partly the result of folding and partly the result of faulting.

In areas where the folding has been contemporaneous with the sdimentation the crestal portions of the anticline are liable to contain considerable gaps in succession, whereas synclinal or basinal areas may contain a complete sequence of sediments. On the flanks of such folds shore-line conditions, the development of overlap and overstep and the wedging out of the sand lenses are very prone to occur. Furthermore, the instability of the sea floor during the processes of sedimentation creates guiding conditions for the marine currents which govern the distribution of the sand lenses. All these features play their part in the ultimate positions of the gas and oil accumulations and we see in them the same influence as in the more simple regional structures, though their influence is not perhaps of such a dominant nature.

When it is realized that many of our oil wells penetrate to 10,000 feet or even greater depths, it can readily be seen that there is considerable scope for modifications in the form of the underground structure as it is tested to such depths. Deeper drilling in the folded strata of oil fields soon brought geologists face to face with the fact that where the strata comprising the fold are of great differences in elasticity, the general form of the fold alters materially from rock to rock. No better example of this feature can be given than the fields of Iran where the relatively plastic semi-exposed formations, i.e., the Fars, underlie a rigid group of exposed formations, the Bakhtiari, and overlie a strong limestone, the Asmari, in which the oil is found. The results of these conditions are that the exposed Bakhtiari and Fars formations give surface structures which are highly conflicting both with each other and with the structure of the underlying Asmari Limestone. The crestal regions of the lower beds are often some distance away from the observed crestal area in the overlying Fars, and geologists are set an exceedingly difficult problem in attempting to locate the probable shape of the Asmari with so much plastic folding in the rocks which provide surface evidence.[13] These changes in the fold forms are not always due to difference in rigidity of the formations. Sometimes they are an expression of the changes in the intensity of the folding or in the thickness of the strata, but obviously, with all these complexities the oil geologist is set a difficult task when controlling drilling to such great depths.

In general oil and gas occur more abundantly in foothill structures of mountain regions where folding is not so intense. It is not quite clear whether this regional distribution is the result of a tendency for general oil migration toward the edges of the basinal areas which normally become the zones of foothill folding, or whether it is also the result of the excessive oil dispersal induced by intense folding and fracture which leads to the destruction of oil accumulations. In any case it is a well known phenomenon that the main accumulations tend to occur where the folding is of a relatively gentle nature corresponding with the symmetrical and asymmetrical anticlines.

Perhaps this tendency has been somewhat exaggerated in the literature for there can be no doubt that oil accumulations of great size are found sometimes in areas where the folding is quite intense. Occasionally oil pools of the first order of importance are found in structures associated with great over-riding thrusts where the surface and sub-surface tectonics are exceedingly complicated. An example of such a field is Boryslaw, (Figure 6) the most important oil field of the Northern Carpathians, where the oil has accumulated in a broad gently-dipping recumbent fold of Oligocene and Miocene strata overridden by a nappe sheet of highly deformed Cretaceous and Eocene strata. This particular case must be one of the best authenticated examples of a great overthrust, for the drilling which has penetrated to depths of approximately one mile has given such a mass of evidence of the whole structure that the form of the folding and the position of the thrust can be given with considerable accuracy over an area stretching back several miles from the outcrop of the thrust plane.[14]

Intense Thrusting

Turner Valley in the foothill region of Alberta is another example of a large oil field complicated by intense thrusting and it must be admitted that with the more exact geological methods of

■ CONTINUED ON PAGE 37

Lateral Drilling OF LIMESTONE RESERVOIRS

By WILLIAM P. STERNE, Staff Writer

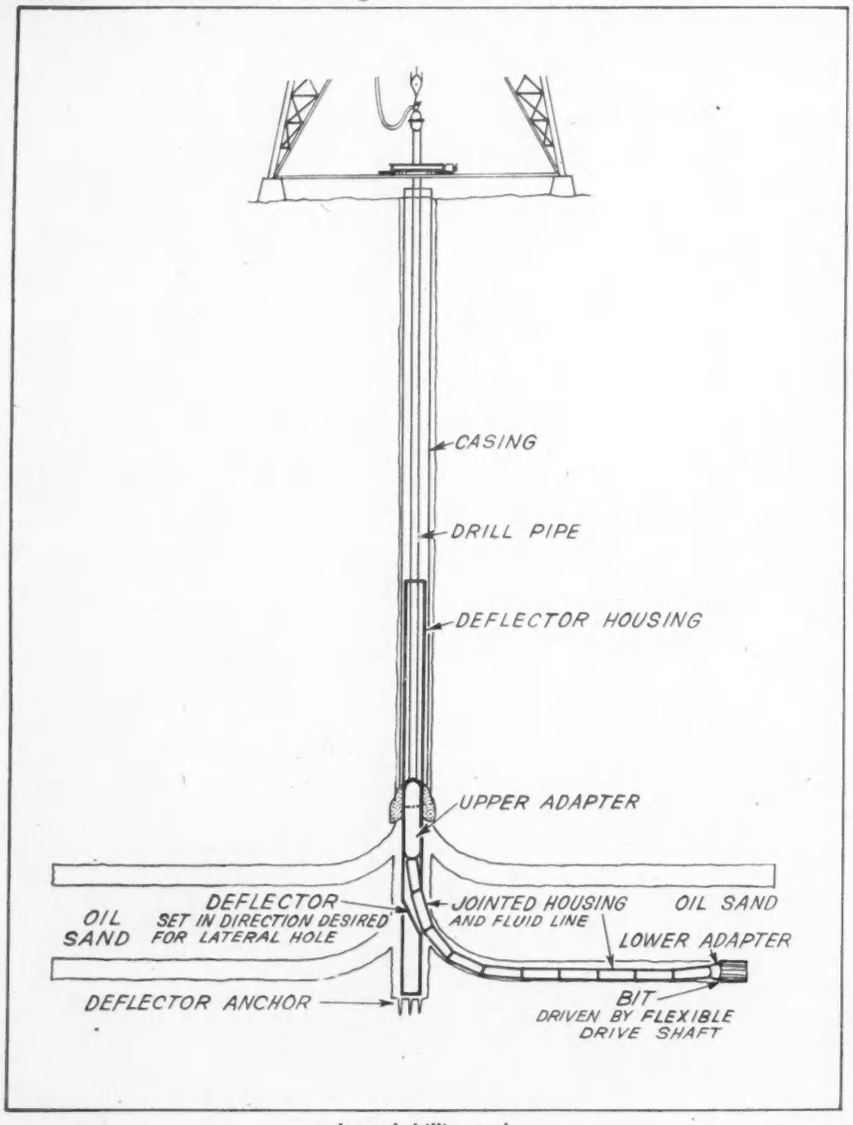
IT HAS long been considered desirable in fractured limestone producing reservoirs to increase the drainage radius of a well by drilling lateral or horizontal holes outwardly from the main well bore, and many different types of equipment have been tried with varying degrees of mechanical success.

The Stanolind Oil & Gas Company, Tulsa, has for four years been drilling satisfactory lateral holes in limestone formations, utilizing a specific type of lateral drill.

The original drilling with the lateral drill was in the Pine Island field, Louisiana. Production in this field is from the Annona chalk, found from 1500 to 1700 feet. The productive section of the formation is a rather soft, impermeable oil-saturated limestone. Since reserves are thought to be appreciable, it was decided to attempt to increase production by experimenting with lateral drilling. Fifty-four lateral holes were drilled in six wells. In most wells four lateral holes were drilled at each of two levels, but in one well 16 lateral holes were drilled at four levels.

The total footage of the 54 holes was 1200 feet and the over-all average drilling time was approximately 10 to 15 minutes per foot of lateral hole.

At first 37-gravity oil was used for circulation, but with the equipment available poor cutting returns were obtained. After changing to 17-gravity oil, cuttings were satisfactorily circulated out. The laterally drilled holes were acidized and the over-all workover program resulted in an increase in production. It is impossible, however, to determine the production increase caused by lateral drilling alone.



Lateral drilling tool.

TABLE 1

Data on Laterally Drilled Holes

FIELD	County	State	Depth of Lateral Drilling	Formation	No. of Holes Drilled	Total Footage Drilled	Avg. Drlg. Time, Min./Ft.	Circulating Fluid	No. Wells Drilled
Pine Island..	Caddo.....	Louisiana.....	1500-1625	Annona Chalk....	54	1200	10 to 15	17° Crude	6
McCamey...	Upton.....	Texas.....	2012	San Andres	1	25	101	29° Crude	1
Slaughter....	Hockley....	Texas.....	5017-5021	San Andres	4	80	98	33° Crude	1
Slaughter....	Hockley....	Texas.....	4874-79 4924-28	San Andres	7	121	95 to 50	33° Crude	1

McCamey Experiment

Upon completion of drilling in the Pine Island field, an attempt was made to laterally drill a well in the McCamey field, in Crane and Upton counties, West Texas. In this field a well was selected for drilling, with the zones laterally drilled chosen from a permeability profile and caliper log. Upon attempting to drill it was found that approximately seven barrels of circulating fluid were being lost every hour. This excessive loss of returns resulted in a stuck bit and caused abandonment of drilling after completion of only one lateral hole.

Upon attempting to pull the tool from the hole it was found that the bit was stuck, necessitating the cutting off of the tubing, which was being used as a drill pipe, and fishing with cable tools. In order to loosen the stuck tool, acid was spotted on the bottom. The tool was jarred out with cable tools, but the acid increased the formation permeability to such an extent that it was impossible to fill the hole with oil; therefore, the lateral drilling had to be abandoned at this location.

Lateral drilling and acidizing to remove the tool in the well resulted in an increase in production, although the amount of increase due to lateral drill-

ing could not be differentiated from that caused by acidization.

The next drilling effort was in the Slaughter field, where the San Andres pay is found at 5000 feet. The zone to be laterally drilled was again selected from a permeability profile and caliper survey. Four lateral holes were drilled for a total footage of 80 feet. Average drilling time was 98 minutes per foot. The lateral drilling at this well, however, did not improve the well productivity.

Another well in the Slaughter field was laterally drilled, and at this location definite results were obtained. The well, upon initial completion, produced 1.5 barrels of oil per day natural, on a 24-day test. Following the initial testing, seven lateral holes, totaling 121 feet in length, were drilled at approximately 5000 feet, with an average drilling time of 50 to 100 minutes per foot. Upon completion of lateral drilling, the well tested 13 barrels of oil per day natural on a ten-day test. The well was tested for an appreciable time and then acidized, after which production was 49 barrels per day. Following several months of production, the settled rate was 25 barrels of oil in one day, which is an appreciable increase, due to the lateral drilling and acidizing.

Lateral Equipment

The lateral drill used is composed of an outer housing, inner housing, drive shaft, torsion limiter, deflector rotator, whipstock and anchor, and is composed of 206 individual pieces of material. The outer housing has a maximum diameter of six inches at the deflector window, which limits use of the tool to wells equipped with seven-inch or larger casing.

The lateral drilling equipment utilizes bits varying in size from 5¼ to 6¼-inch and is sufficiently rugged to permit the application of approximately 12,000 pounds weight on the bit. Since tubing is generally used for rotation, it is necessary to obtain the bit weight from drill collars.

Located vertically between the outer housing and the anchor is the deflector rotator, which is so constructed that the face of the whipstock can be rotated, thus permitting the drilling of four holes in sets of two holes each, without the removal of the drill pipe from the hole. One set of holes is several feet higher than the other and each set is 180 degrees apart. Within the inner housing is a flexible drive shaft, constructed of universal joints, which has a travel of 25 feet, permitting lateral drilling of a hole 25 feet long. This flexible shaft, which is protected from wall contact by jointed housing, transmits the torque from the drill stem, which may be tubing or drill pipe, to the bit through the curving hole. To prevent difficulty that might result from the bit hanging up, a torsion limiter is provided on the drive shaft. This piece of equipment cuts off the flow of drilling fluid when the torque exceeds a predetermined value. Since the drilling fluid is transmitted to the bit through the universal joint flexible shaft, it is obvious that oil must be used for circulation. The tool is stoutly constructed and when in good condition can be operated without mechanical difficulty.

Table 1 presents a summary of pertinent information regarding nine wells that have been laterally drilled.

Geology Applied to Petroleum

■ CONTINUED FROM PAGE 33

the present day many anticlinal structures when examined in detail are much more complicated than they were originally supposed to be. Sometimes underground thrusts and reversed faults provide excellent impermeable zones which effectively trap the underlying oil, and in such cases oil is found not only in the crestal zone of the folding, but also in the deeper accumulations below the thrust planes. In most of these examples of accumulations in complicated structures there exists a rather plastic formation which is able to remain sealed in spite of the complexity of the rock disturbance and it is this latter feature which explains the preservation of the accumulation.[15]

There can be no doubt that the deformation of some rocks creates a considerable induced porosity which may act in two ways. Firstly, where the reservoir rock is rigid and compact the joints, bedding planes and fracture planes become considerably enlarged and they offer sufficient porosity and permeability to enable a considerable quantity of the oil to accumulate within them. Possibly of still greater importance, they allow this oil to move readily within the tight formation in spite of its lack of original pore space. This consideration, it may be noted, comes very close to the original conception of Andrews that it was the fissuring of anticlinal crests which led to their enrichment. A good example of a reservoir rock which owes its efficiency largely to such conditions is that of the Asmari Limestone in Persia, where it is often the steeply dipping and more deformed flank which is found to be the most productive because of the increased disturbance of the rock in this portion of the structure.[16]

Lead to Escapes

Secondly, in addition to the production of increased permeability in the reservoir rock itself, there can be no doubt that increased rock disturbance creates additional fissure zones across the strata in some portions of the structure and in all save the highly plastic formations additional means of escape are given to the oil and gas, of which they take full advantage. It is a well known feature that folded regions are particularly prone to develop strong surface shows of oil and in some areas the means of transformational migration become so strong that they lead to the escape not only of gas and oil, but of great quantities of mud which may be carried for great distances through the strata. The curious phenomena of mud flow dikes which have been well described by Dr. Kugler in Trinidad[17] and which are known to occur in many other oil field regions, notably in the Caucasus, are strongly reminiscent of igneous activity though they have no relationship with these phenomena. The probability is that in these cases we are dealing with gassy and oily muds which are highly mobile and which under the control of stresses due to lateral pressure and the weight of the overlying rocks seek to escape from the zones of high pressure wherever the fissuring of the structure allows movement. It is only within the last decade that these phenomena have begun to be understood properly and it can be realized with what consternation the geologist would face such a phenomenon wherein a sedimentary material behaved like an igneous intrusion, producing dikes, sills and contemporaneous surface flows, though the material involved was typically sedimentary. When furthermore paleontological evidence revealed that the intruding sediment contained fossils from rocks which in their normal sequence lay thousands of feet below, the confusion in borehole evidence which these produced can be readily understood.

More Research Needed

There is still scope for more research on the transformational movements of sediment, particularly as to how such movements are initiated, but there can be little doubt that they can only occur where the presence of important fractures and fissures within the rock mass allows the highly mobile material to move en masse. When such things can take place in nature it is obviously a very simple matter to concede the passage of gas and oil across strata wherever they are not completely impermeable. Unfortunately such transformational migration seems to some geologists to be contrary to the normal conditions of accumulation, and they have therefore decried its importance. It is, however, surely a question of degree. Certain types of rock structures and certain types of rocks are much more compact and impermeable, and in these cases the oil and gas are readily held completely within the reservoir rocks. In folded and faulted strata there may be vertical as well as lateral migration, and in such cases the phenomena of gas and oil dispersal is very prone to occur. Thus it is much more difficult to preserve oil pools in folded and disturbed strata than in the less deformed regional structures. This is one reason why Palaeozoic oil pools are usually in regions of slight deformation. The exceptions can nearly always be ascribed to an excessive cover of younger rocks of to cap rocks of abnormal plasticity.

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(This is one of a series of five articles. The third will appear in an early issue.)

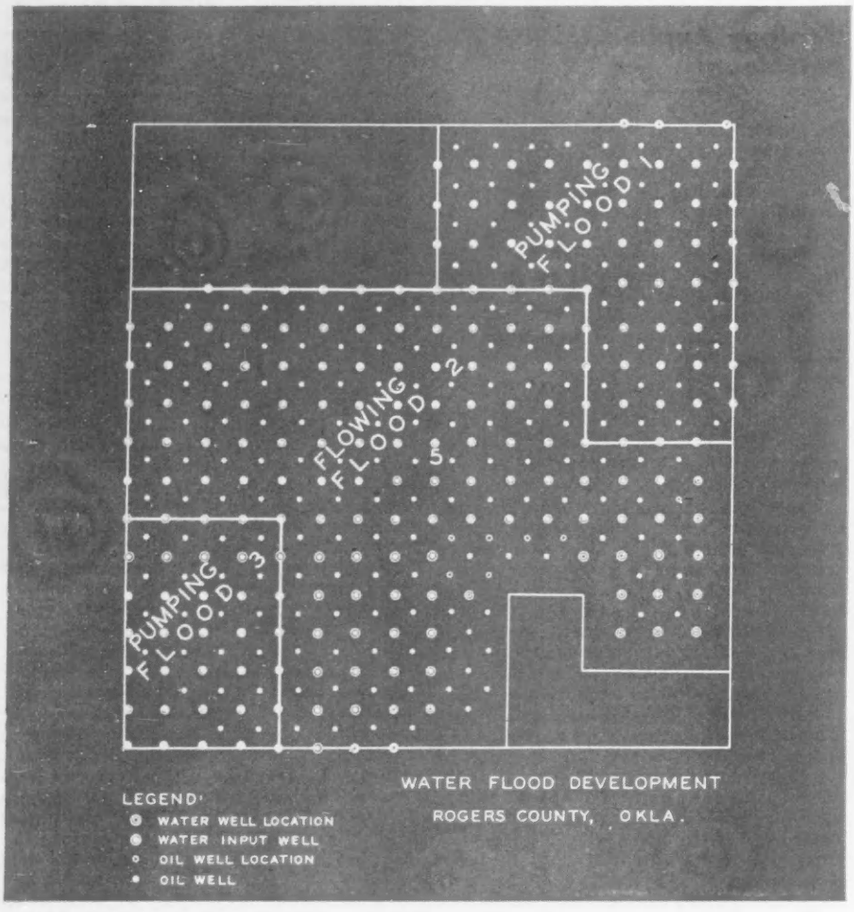


FIGURE 1

Flowing Production vs Pumping Production

IN WATER FLOOD OPERATIONS

By R. C. EARLOUGHER
Earlougher Engineering, Tulsa

IN PRIMARY producing operating production is obtained by flowing when sufficient reservoir energy is present. In the absence of such energy, artificial producing methods are required. The operator cannot arbitrarily choose whether production will be obtained by flowing or pumping.

However, in secondary recovery water flood operations, the operator has the choice of flowing or pumping the producing wells. The advantages and disadvantages of flowing versus pumping producing wells in water flood operations are frequently discussed, although little factual information has been presented.

In an effort to determine accurately the relative merits of the two producing methods, an exhaustive study has been made of three leases containing 520 acres, of which 427 acres have been subjected to secondary recovery water flood operations. Of the 427 producing acres studied, 169 acres have been developed for pumping production, while 258 acres have been developed for flowing production. The investigation involved detailed study of all operational data obtained from 427 contiguous areas in Township 24 North, Range 17 East, Nowata County, Oklahoma.

The development program for the area, shown in Figure 1, indicates a uniform spacing pattern of 330 feet between like wells. That is, water injection wells are located 330 feet from each other and producing wells are likewise 330 feet from each other. As indicated in the figure, acreage developed for flowing production is located between the acreage developed for pumping production. Both flowing and pumping leases were developed by the method of delayed drilling with development covering a period of many months.

Production in this section of Oklahoma is obtained from the Bartlesville sand which occurs at depths of 370 to 430 feet.

Figure 2 presents data showing the average water input and oil production expressed as barrels per day per acre and the net water-oil ratio. In calculating the developed acreage both oil and water acres have been used. This approach is necessary since each unit is furnishing all of the water for more than half of the line wells so that some water is affecting acreage outside the unit. While all of this water is charged to the unit in question there is a certain amount of waste water that is not aiding the flood, but which nevertheless must be injected. In order to eliminate this factor in comparing the efficiencies of the three units approximately 2.5 acres has been allowed for each input well. Total daily water input has been divided by total water wells times 2.5 acres to get the average injection volume expressed as barrels per day per acre. In general, because of line wells, the water acreage will always exceed oil acreage. An exception is when a lease is fully developed with all surrounding leases likewise developed and with operators dividing all of their line wells so that each is furnishing his share of water to these wells.

Average Water Injection Rate

As indicated in Figure 2, the average injection rate for pumping Flood 1 was relatively low from the beginning, although it was higher the last 1½ years than it was the first 1½ years. For the first 19 months, water injection averaged eight barrels per day per acre and then increased to about 12-13 barrels per day per acre. Water injection for flowing Flood 2 was fairly uniform the first 2½ years at approximately 14-15 barrels per day per acre, which is higher than for the pumping Floods 1 and 3. The daily average for the last two years fluctuated considerably and averaged 13 to 14 barrels per day per acre. Thus, the injection rate during the third and fourth years for the Flowing Flood was higher than Pumping Flood 1 and lower than Pumping Flood 3. Flood 3, a pumping project, had a lower average daily injection rate than Flowing Flood 2, averaging about 13 barrels per day per acre for the first 1½ years. The injection rate for the next 15 months increased to 21-22 barrels per day per acre and then decreased to about 18 barrels per day per acre. In summary, the Flowing Flood had an injection rate between the two pumping projects, paralleling Flood 3 during its early life and Flood 1 during its later life.

The ratio of injected water to oil produced is a very good criterion of a water flood's efficiency and is a controlling economic factor. The net ratio is the comparative volume of water injected to oil produced on a per acre basis, not taking into account water that goes into line wells and onto adjoining leases.

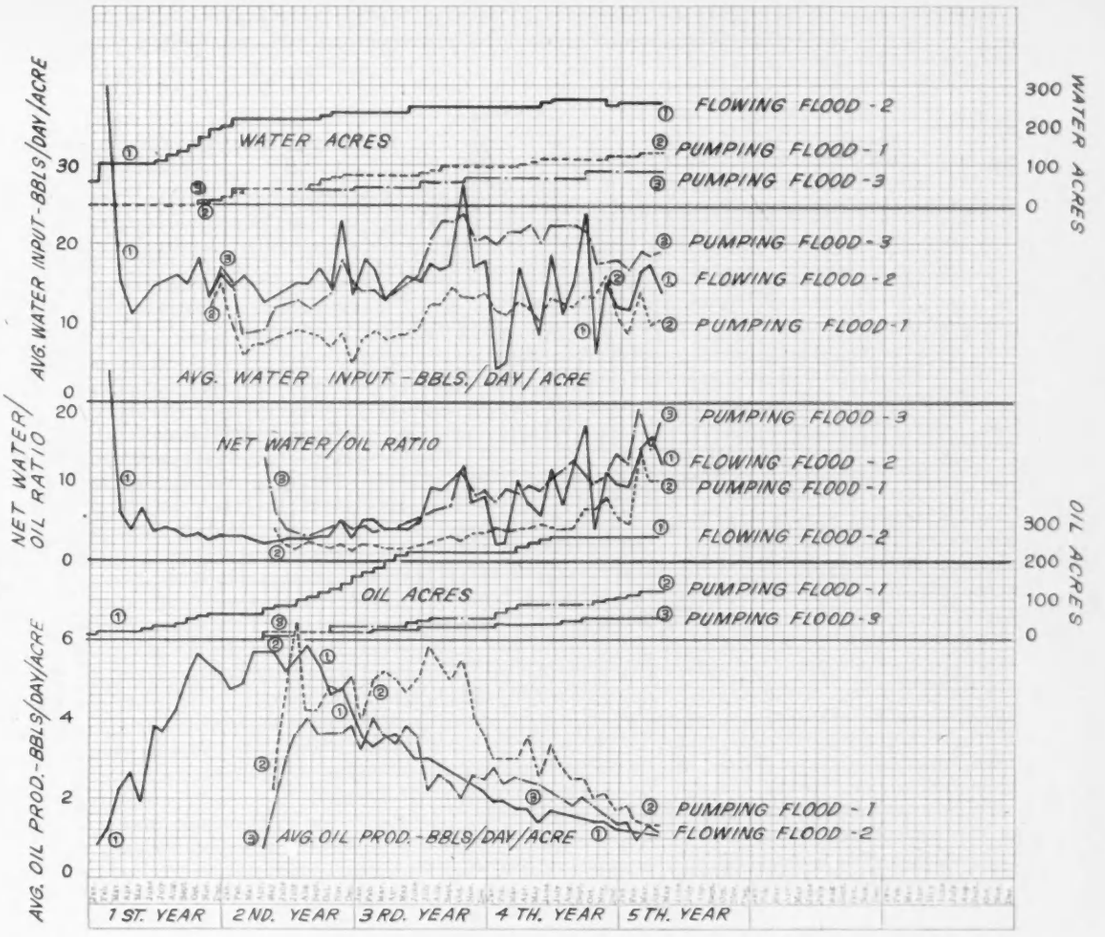


Figure 2. Average oil production and water injection bbls. per day per acre.

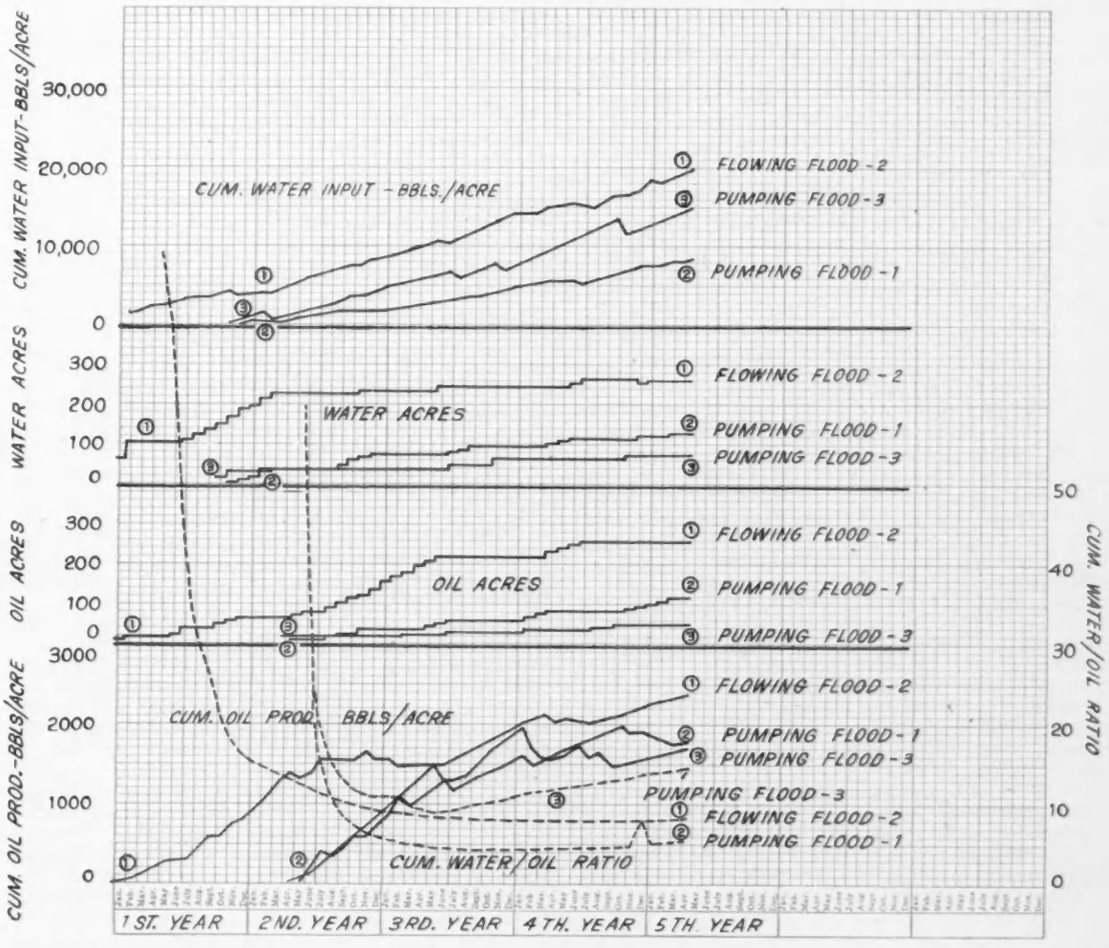


Figure 3. Cumulative oil production and water injection bbls per day per acre.

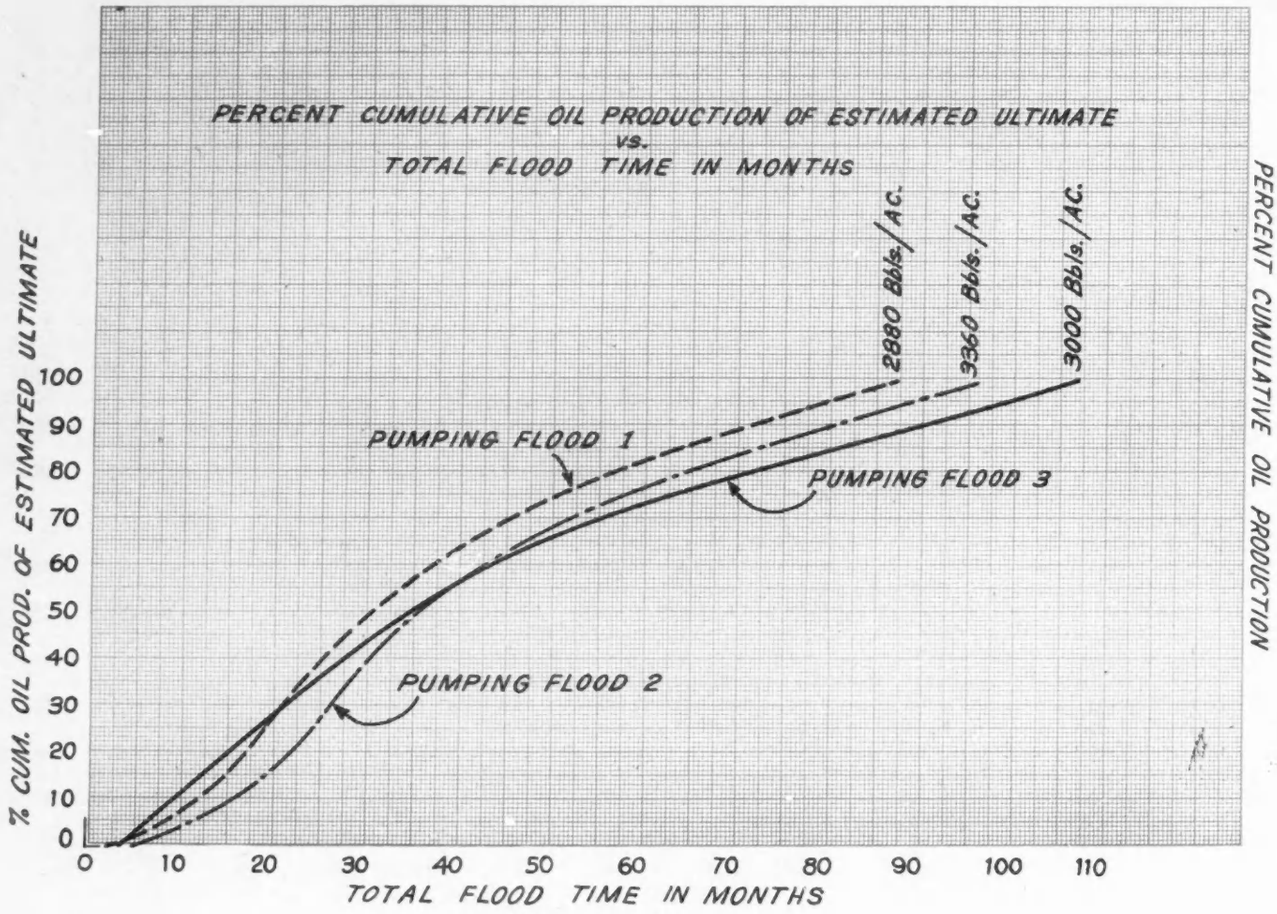


Figure 4. Percent cumulative oil production.

When this additional water is considered the relationship becomes a gross ratio. The gross ratio is important, as it represents a direct cost which will vary with the number of line wells but will not indicate what is occurring in the sand under the lease. The net water oil ratio for Pumping Flood 1 has been unusually low compared with most Bartlesville sand floods and represents a most favorable condition. During the first 18 months after oil production became appreciable, it varied from 1.2 to only 3. 3 to 1. Since that time the ratio has steadily increased until it attained 10.0 to 1. The period of low ratios is probably the result of low water injection rates and perhaps also to sand of lower permeability. At the time of peak oil production the ratio was 2.2 to 1. The net water oil ratio for the Flowing Flood has been very favorable for Bartlesville sand, although higher than for Pumping Flood 1. The low ratio of 2.2 to 1 occurred during the 16th month and gradually increased until the 31st month, when the ratio was 5.8 to 1. After the 31st month the rate of increase was much greater. After 38 months the ratio was 9.2 to 1 and after 51 months the ratio was 12.3 to 1. At the time of peak oil production the injected water oil ratio was 2.2 to 1. The generally higher ratio that has resulted from the Flowing Flood as compared to Pumping Flood 1 may be due both to higher injection rates, possibly higher permeability and by-passing troubles encountered when the project was initiated. The net water oil ratio for Pumping Flood 3 has been higher throughout the operation. A low of 3.1 was observed at the time of peak oil production. After 37 months the net ratio was 17.7 to 1. It is indicated by the net water oil ratio that the Flowing Flood 2 has a ratio approximately intermediate to the Pumping Floods 1 and 3.

Reference to Figure 2 indicates that the production rate for the Flowing Flood has been higher than for either of the Pumping Floods. However, peak production on the Pumping Floods was reached in a much shorter period of time than for the Flowing Flood. The Pumping Floods also declined at a much faster rate than the Flowing Flood after having reached peak production. Peak oil production for Pumping Flood 1 was attained after 15 months flooding. Production at this time was 5.75 barrels per day per acre. The high of 6.4 barrels per day per acre is a false value resulting from small operating acreage at the time and benefit from earlier flooding on Flowing Flood 2. Peak oil production for Flowing Flood 2 was approximately the same as Pumping Flood 1. A peak of 5.7 barrels per day per acre was attained during the 16th month. After 52 months operation the daily average production was 1.10 barrels per day per acre, which is only 0.15 barrels less than Pumping Flood 1 after only 37 months, and about the same as Pumping Flood 3 after 37 months. Daily average production for Flowing Flood 2 was 1.86 barrels per day per acre after 37 months, which compares with 1.25 barrels per day per acre for Pumping Flood 1 and 1.06 barrels per day per acre for Pumping Flood 3. Peak production for Pumping Flood 2 occurred during the fifth month. The rate was four barrels per day per acre, which is a lower peak than either of the other operations. The quicker peak was caused by earlier water injection on the Flowing Flood and by the relatively small developed acreage at the time. The rate of decline for Pumping Flood 3 was also more gradual. After 37 months operation the daily rate was 1.06 barrels per day per acre, which is slightly less than for the other two floods.

Figure 3 presents cumulative oil production, water injection data, water oil ratios and the oil and water acres previously presented in Figure 2. Cumulative oil production for the three floods was 1780 barrels per acre for Pumping Flood 1; 2370 barrels per acre for Flowing Flood 2; and 1685 barrels per acre for Pumping Flood 3; after flood months of 36, 52 and 37, respectively. At the end of 37 months the cumulative recovery for Flowing Flood 2 was 2040 barrels per acre. It is noted that the water injection curves reverse their upward trends at different times. This condition is caused by incorporation of additional acreage which of course results in a reduction in the barrels per acre figure. After 51 months injection, 20,050 barrels per acre had been injected on Flowing Flood 2; 8825 barrels on Pumping Flood 1, and 15,380 barrels per acre for Pumping Flood 3. At the time of peak oil production 5380 barrels per acre had been iniected on the Flowing Flood and 3659 barrels per acre and 3120 barrels per acre on Pumping Floods 1 and 3, respectively. At the end of 37 months operation the cumulative volume of injected water was as follows, Flowing

Flood, 14,680; Pumping Flood 1, 8825; Pumping Flood 3, 3120 barrels per acre. The cumulative water oil ratio curves indicate that Pumping Floods 1 and 3 had values of 4.96 to 1 and 9.12 to 1 after 36 and 37 months, respectively, while the Flowing Flood had a ratio of 8.4 to 1 after 51 months. At the end of 38 months the Flowing Flood had a ratio of 7.1. It is readily apparent that the Flowing Flood is intermediate to the pumping floods.

Extrapolation of production data indicates that the Pumping Flood 1 should ultimately recover approximately 2880 barrels per acre or 180 barrels per acre foot in 88 months; Flowing Flood 2 should recover about 3360 barrels per acre or 210 barrels per acre foot in 98 months; and Pumping Flood 3 should recover approximately 3000 barrels per acre or 176 barrels per acre foot in 107 months. Ultimate recoveries were estimated to an economic limit of 1.25 barrels of oil per well per day.

Oil production from a pumping flood normally may be expected to increase sooner than from a flowing flood so long as the oil wells are drilled soon after water is turned into the injection wells. The reason for this is, of course, obvious. After water injection is begun oil will soon start to flow into the producing wells as a result of the pressure gradient established between input and producing wells. When production is by pumping, only sufficient bottom hole pressure is necessary to provide pump submergence. In flowing operations, however, no oil will be produced until enough water has been injected into the sand to raise the pressure in the formation surrounding the oil wells to a point high enough to offset the weight of the fluid column which builds up in the oil well. The time necessary to obtain this required pressure results in the lag in production which exists between flowing and pumping operations.

In order to study this lag on the three operations, cumulative oil production for each of the units expressed as percent of estimated ultimate recovery has been plotted against flood life in months in Figure 4. In the case of each unit flood, month No. 1 was taken as the first month water was turned into wells located on the individual leases disregarding the water that had previously gone into line wells. This last factor is believed to be the cause for the fairly early start of each curve at about the third month. This, together with the fact that some of the first line of oil wells on Flowing Flood 2 were pumped for a while, is also probably the cause for the early increase in production on Flowing Flood 2 during the first six months. Had the wells not been pumped it seems probable that first oil production would not have occurred until the sixth or seventh month.

In comparing curves for Pumping Flood 1 and Flowing Flood 2 it is to be noted that up to about the 25th month the Pumping Flood 1 was rising faster, resulting in a greater lag each month in cumulative oil produced so that at the end of the 25th month Flowing Flood 2 was almost 12 percent behind Pumping Flood 1. At 30 months Flowing Flood 2 had recovered 38 percent, or the same as the Pumping Flood 1 had at 25 months. From that time on the slopes of the two curves are about the same, which means that Flowing Flood 2 was five months behind Pumping Flood 1 in percent cumulative production. At the economic limit Flowing Flood 2 will be about 10 months behind, but at the same time it is estimated that the cumulative oil produced will be about 480 barrels per acre greater.

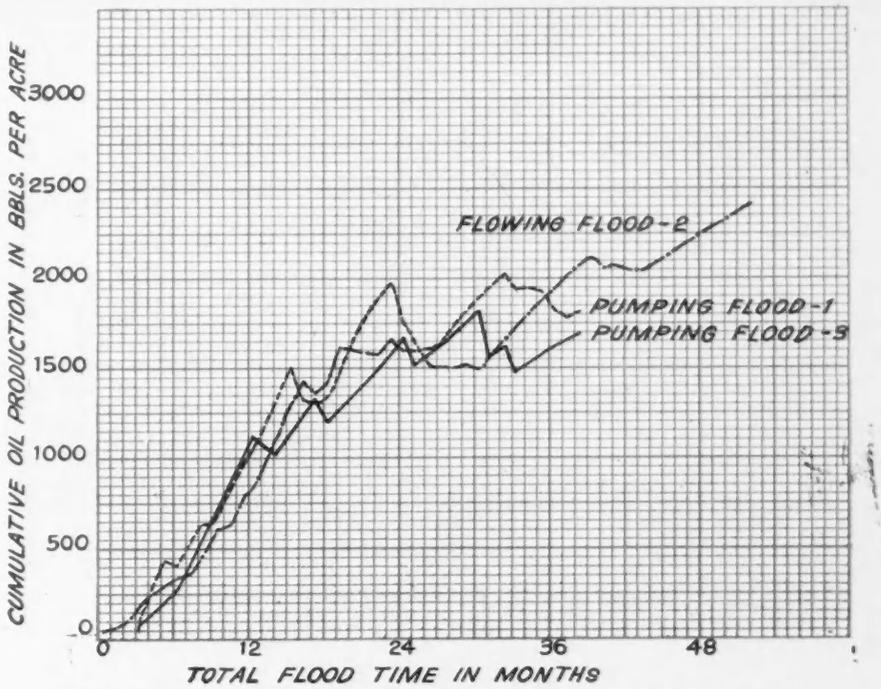


Figure 5. Cumulative oil production in barrels per acre vs total flood time in months.

Curve for Pumping Flood 3 is not very good for comparison because of the large magnitude of effect of early line wells on the small acreage and rate of oil recovery.

Since the economic success of any flood depends on both ultimate oil recovery and rate of recovery, and also since the time required to obtain appreciable oil production after water injection is begun govern to some extent the initial investment required, the cumulative oil recovery for the three units has been plotted against time in Figure 5. Cumulative oil as barrels per acre against flood time in months is shown for the Pumping Flood 1 and Flowing Flood 2 and for the Pumping Flood 3 and Flowing Flood 2.

In comparing Pumping Flood 1 and Flowing Flood 2, it can be seen that in general during the first 15 months, recovery on Flowing Flood 2 was about 1½ to 2 months behind Pumping Flood 1. This, of course, is not true during the first seven months because of pumping wells on Flowing Flood 2 as previously mentioned. Because of additional drilling on both leases after the 15th month the cumulative figures vary so much it is difficult to make a definite comparison. It is easy to see that after 38 months and taking into account average production as previously discussed, Pumping Flood 1 should continue to fall behind Flowing Flood 2.

In comparing Flowing Flood 2 and Pumping Flood 3 on this basis it is seen that Flowing Flood 2 lagged about one month behind for the first 13 months and then because of new acreage added to Pumping Flood 3, Flowing Flood 2 went ahead and remained ahead for the most part.

From studying these data it would appear that production by flowing lags only 1½ to two months behind that produced by pumping on similar acreage. What it does not show is the large number of water wells drilled ahead of developed oil acreage for Flowing Flood 2. This drilling represents an investment not fairly considered in this comparison alone. The discussion to follow will deal with that factor.

Inasmuch as oil and water wells drilled represent the greatest part of development cost, the total number of wells drilled up to any given period should reflect to a large degree the cash investment in the project. With this in mind, the cumulative oil recovery expressed as barrels per acre per total wells (oil and water) drilled has been plotted against flood months as shown at the left in Figure 6.

These curves indicate a much greater lag for Flowing Flood 2 when the number of total wells drilled is taken into account. This difference between Flowing Flood 2 and Pumping Flood 3 varied from about five to seven months during the first 14 months but after new drilling decreased, was not appreciable. About the 30th month Flowing Flood 2 surpassed Pumping Flood 3 and continued above.

The lag between Flowing Flood 2 and Pumping Flood 1 was not so great in general but lasted for a period of almost three years. The lag varied from four to nine months, with the greatest difference occurring about the 30th month at the end of an extensive drilling program on Flowing Flood 2. Six months later the Flowing Flood 2 curve rose above Pumping Flood 1 and should remain above for the remainder of the flood life.

Again the Flowing Flood 2 curve is misleading during the first six to 12 months because of the pumping production. Had some wells not been pumped, it seems probable that production should have commenced in six to eight months. This is in agreement with the data presented in Figures 4 and 5.

In comparing flowing production with pumping production, some consideration should be given the difference in cost so

Cumulative oil per well vs total flood time in months.
(Cumulative oil per well equals gross cumulative oil production divided by total number of oil and water wells completed.)

Cumulative oil per well adjusted for higher development and monthly operating costs.
(Note: Estimated additional cost of pumping: Development per oil well $600; operating per month $300).

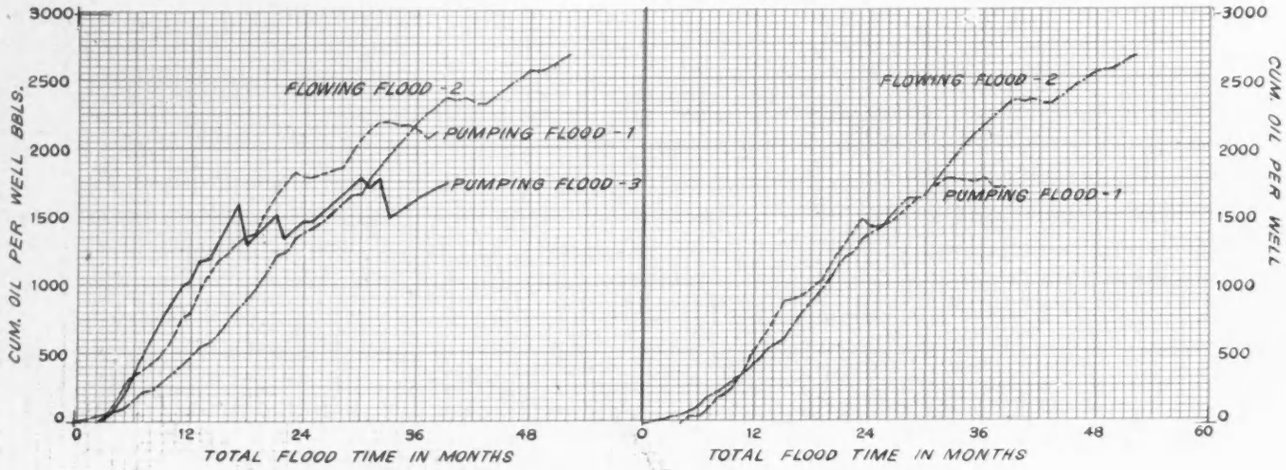


Figure 6. Cumulative oil per total wells drilled (oil and water wells).

as to get a satisfactory idea of the rate of investment return. Since development costs for flowing production are less and since operating costs are lower, it does not require as much production to pay out the initial investment. In lieu of actual cost figures for the three units, Pumping Flood 1 cumulative oil per total well curve was adjusted to allow for the higher costs of pumping on an average basis of difference in cost of oil wells and estimated difference in operating expense. Fixed lease costs were not considered as they should be similar for the two producing methods.

The basis on which the adjustment has been made is that the initial cost of an oil well at the depth involved is $600 greater for pumping than for flowing and that pumping operational expenses will be about $300 per month greater than for flowing. For simple calculations gross oil was assumed to be worth $1 per barrel to the operator.

In making this adjustment the cumulative data shown for Pumping Flood 1 at the left of Figure 6 were reduced by 600 barrels for each oil well drilled and 300 barrels each month to allow for additional operating expenses. In this manner the Pumping Flood 1 curve has been put on a comparative basis with Flowing Flood 2 so far as return of investment is concerned.

The adjusted curve for Pumping Flood 1 is plotted with Flowing Flood 2 curve on the right of Figure 6. From these data it is to be noted that cumulative oil in barrels per well drilled for Flowing Flood 2 only lagged two to 1½ months behind Pumping Flood 1 for the first two years and then Flowing Flood 2 surpassed Pumping Flood 1. This would seem to indicate a considerable advantage in flowing over pumping from an economic standpoint. A two-month longer payout is not unreasonable considering the greater ultimate return that should result with flowing operation.

Conclusions

For the foregoing discussion the following conclusions may be made regarding the results obtained by flowing water flood production and pumping water flood production:

1. The three operations discussed herein have been assumed to have comparable sand conditions with respect to oil saturation at the time flooding was commenced. From drillers' logs it appears reasonable that sand thickness under the three leases is comparable.

2. The two pumping floods were developed by delayed drilling on 330 x 330-foot spacing and have been operated by pumping all oil wells. The Flowing Flood was similarly developed by delayed drilling on 330 x 330-foot spacing and practically all of the oil wells were produced by controlled flowing. Development of all units was continuous, although the Flowing Flood was started 14 month ahead of the Pumping Floods.

3. The Flowing Flood was two months longer in coming onto a good oil production rate; however, when it did come into production the rate was as favorable as that for the pumping operations.

4. At the end of 38 months operation (current life of the pumping floods) cumulative oil production for Flowing Flood 2 was 2070 barrels per acre compared to 1780 barrels per acre for Pumping Flood 1 and 1654 barrels per acre for Pumping Flood 3.

5. The estimated ultimate oil recovery for Flowing Flood 2 is 3360 barrels per acre over a period of 98 months compared with Pumping Flood 1 estimated ultimate of 2880 barrels per acre in 88 months, and Pumping Flood 3 estimated ultimate recovery of 3000 barrels per acre in 107 months.

6. The production decline rate for Flowing Flood 2 is more gradual than for the Pumping Floods.

7. Although the data indicate a greater ultimate recovery for the Flowing Flood it should not be concluded that flowing necessarily results in greater recovery since the original oil saturation of the sand is unknown, although it is reasonably assumed to be comparable. On the other hand, it can be concluded that flowing should not result in loss of oil recovery and that flowing can be expected to give at least as great an ultimate recovery as pumping.

8. Considering total number of wells drilled it appears that oil production by flowing will lag about six to eight months behind pumping operations. However, when difference in development and operating costs is considered, the lag is reduced to approximately two months. After the third year the return from flowing seems to increase above that from pumping.

9. No higher water injection pressures were used on the Flowing Flood than the Pumping Floods with comparable injection and production rates. This fact may have been due to higher sand permeability for the Flowing Flood, which offset the back pressure held on the flowing wells. More field data need be accumulated for sands of known characteristics.

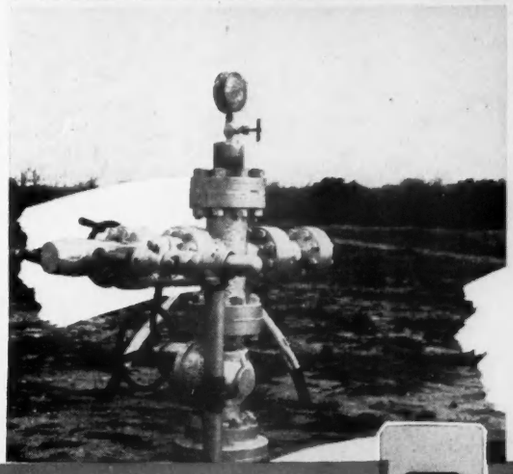
10. Injected water-produced oil ratios, which are a reliable index for flooding efficiency, have been very good for the Flowing Flood. In fact, they compare favorably with the best ratios obtained on Mid-Continent floods. Corresponding ratios on Pumping Flood 1 are even more favorable and are far better than average for Mid-Continent water flood operations. On the other hand, water oil ratios for Pumping Flood 3 have been higher than those on Flowing Flood 2.

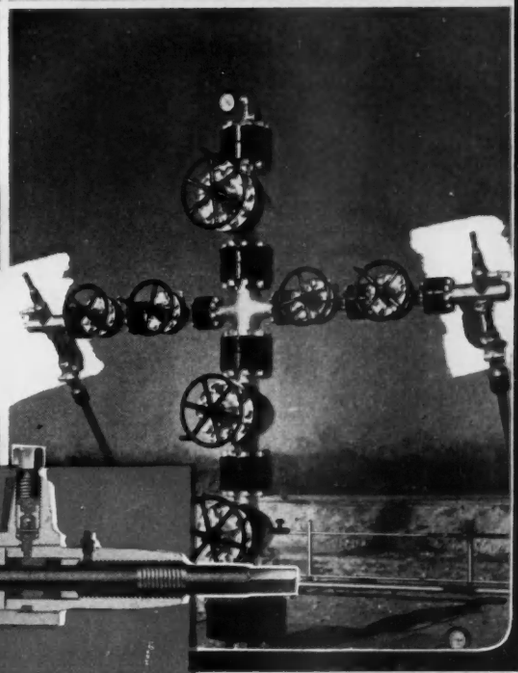
11. Finally, it may be concluded that the data and information gained from examination of results on these three floods, that flowing should be seriously considered when planning a new water flooding development. However, other factors must be considered before making a final decision. The two most important ones probably are depth and permeability of the sand.

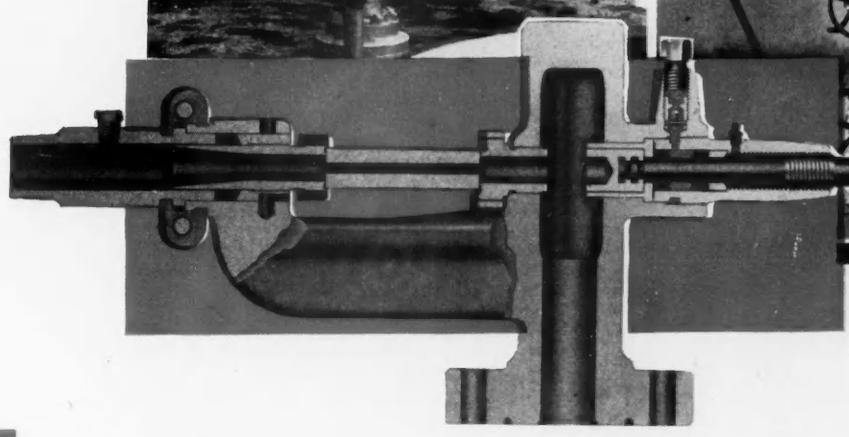
Acknowledgement and thanks are hereby accorded to Thornton Company and Wellsville Oil Company, Nowata, Okla., and Wellsville, N. Y., respectively, and Forest Producing Company, Nowata, Okla., and Bradford, Penn., for permission to publish the information contained in this paper, all of which was taken from report made by the author for Thornton Company in collaboration with the other mentioned companies.

STANDOUT XMAS TREE ACCESSORY

CAMERON FLOW WINGS







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Modern Floating Hotel For Marine Rig Crews

Located almost in the shadow of a large Humble rig, the two-story quarterboat rises like a massive hotel from the flat marshlands surrounding the area. Located approximately 45 miles by water from Humble's Paradis District office, drilling personnel live in comfort aboard the barge during duty days.

FAR FROM dry land in remote marine oil fields of coastal Louisiana, drilling personnel of Humble Oil & Refining Company live in home-like comfort aboard a company-designed quarterboat, known on records simply as "Barge 24," but which actually is a floating hotel equipped with accommodations which surpass many modern cosmopolitan hostelries.

Employing many features designed to relieve the tedium of extended "on-job" days in desolate swamp and marsh locations, every possible consideration is given to the physical and psychological welfare of personnel. Recreational facilities are furnished as well as provisions for comfort, including excellent beds, well-arranged lavatories, temperature regulation, and most important of all, excellent cuisine with almost unlimited quantities of food and coffee.

Rising from the flat marshlands of Louisiana and visible for several miles, the quarterboat presents an impressive appearance with its two-story white superstructure gleaming in the Gulf sunshine, almost in the shadow of one of Humble Oil & Refining Company's large marine drilling rigs. Although separated from Humble's Paradis District office by a 45-mile boat ride, "Barge 24" retains close communication with the office by means of radio and also by crew and food boats which make daily trips from the Paradis landing to the rig.

Drilling personnel, in conformity with duty schedules customary in marine drilling, employ a rotation system by which each man lives on the job for several days, then receives his time off, with the crew boat furnishing round trip transportation. During time on the job, the men not only work their regular tours, but due to the nature of the operation also spend their free time in the vicinity. Thus, establishment of adequate living quarters for the personnel is mandatory in obtaining desirable working conditions and high morale.

40 Accommodated

Humble's quarterboat is built on a steel barge hull 110 feet long, having a 30-foot beam, and drawing four feet of water. Outside dimensions of the "house" are nearly the same, being 28 x 100 feet and leaving space for five-foot decks forward and aft, and 12-inch decks around the sides. The housing section of the boat, designed to accommodate 40 men, is of all-wood construction, rising two stories above the hull and covered externally with ordinary siding material. The roof, peaked to facilitate drainage, is covered with tar and gravel slightly packed. A pole about 25 feet tall stands on each end of the roof for suspending the radio antenna.

Among the oustanding features are the provisions for withstanding in comfort the summer heat. The house section contains 58 large outside windows, while in addition, five fans are provided for air circulation, being of the attic fan type. Two fans serve the upstairs or dormitory portion of the boat, two the lower deck, which contains the dining and living rooms, and one cools the basement, which is situated largely below the water line.

Front entrance into the quarterboat from the main deck boat landing leads to a porch enclosed in a special noncorrosive screen which is essential for service in the salty, humid atmosphere of the Gulf Coast. A doorway from the porch enters the main hall and reception room of the quarterboat, which is also used as a recreation room. This room, extending the entire width of the barge, is provided with numerous comfortable chairs and sofas, tables, and a radio, along with current magazines and other reading matter, and serves as a game room, reading room, library, and meeting room for all personnel. The room is attractively furnished, and has paneled wooden walls with natural stain finish and Venetian blinds for all windows. At the forward end of the room, a stairway leads to the upper deck and the sleeping quarters.

Located immediately behind the recreation room is a large dining room well equipped with tables, chairs, and culinary utensils. Adjoining the room and connected with it by an open service window is the galley which contains all esesntial items for feeding the hungry crews from the rig. Among the kitchen assets are a 9½-foot electric refrigerator operating on alternating current; a diesel-burning marine-type stove, and an ice machine with capacity of making 250 pounds of ice daily. In addition, a suction fan clears air from the kitchen to eliminate objectionable odors, while facilities for good housekeeping include a stainless steel sink with three washing compartments and stainless steel drainboards.

The galley-dining room combination presents one of the most desirable features of Humble's quarterboat, contributing to both the health and morale of the personnel aboard. The daily food boat from Paradis brings fresh meats, vegetables and fruit, and under the direction of skilled and efficient kitchen personnel, tempting meals are served family style. Drilling crews are offered their fill of healthful food in keeping with the physical demands imposed by rigorous manual work.

Across the corridor from the kitchen is located a stairway leading to the basement, and also a bedroom reserved for the cooks and other kitchen personnel, furnished with comfortable beds having innerspring mattresses, and individual tables, reading lights, and steel lockers. Behind the bedroom is a large office where all administrative papers, drilling records, and reports are prepared. A radio telephone is also located in the office and provides direct contact with the Humble Paradis District office and other on-shore locations. A bed is placed in one side of the office for the quarterboat master, toolpusher, or other personnel to assure 24-hour radio service.

Guest Room

Opposite the office is a large room reserved for guests and containing four comfortable beds and a private bathroom having a shower, lavatory, and commode. Electric sockets, wall lamps, lockers, and tables are also provided for guests, and in the corridor outside the door is a cold-water drinking fountain. At the end of the hall, a second staircase is located for access upstairs.

Under the main deck, in the large hull, is the basement, reached by means of a stairway descending from the main corridor. The basement contains the quarterboat light plant, consisting of two diesel engines connected directly to generators which produce 210 volts

of alternating current. Power is supplied by a single engine-generator combination, with the second serving as a standby in event of failure. Also in the basement is an automatic diesel-burning boiler for heating, which carries a maximum steam pressure of 3½ pounds, with an automatic cut-off as a safety factor. When the pressure drops to a minimum, the burners automatically start. An asbestos-covered tank is located in the basement, with capacity of 350 gallons of hot water.

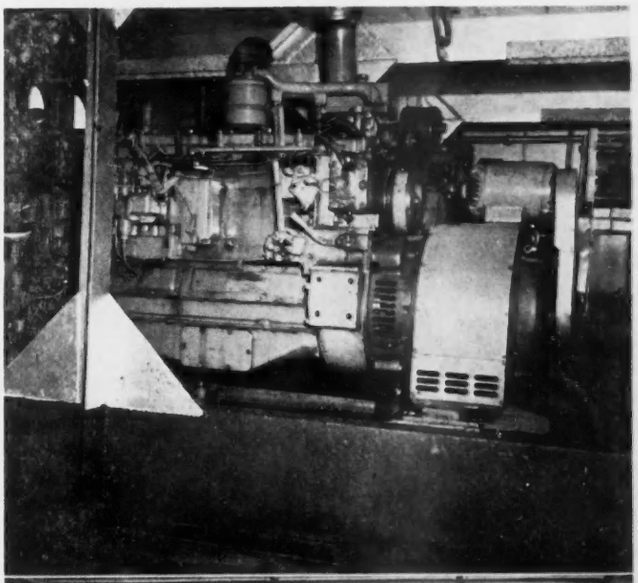
A spare room is provided which will house the quarterboat laundry when a washing machine is available. Also included in the basement accessories are an electric water cooler which furnishes cold drinking water throughout all decks, and a septic tank for chemically cleaning all wastes prior to disposal overboard. The drinking and cold running water pump and regulator are located in the basement and carry 35 pounds of pressure. A food storage room is also in the basement, with the temperature of the cold storage refrigerator maintained at 32 to 35° F.

Main dormitory is located on the second deck, or upstairs, section of the barge, reached by stairs at both ends of the main deck, and beds for 30 men are available. Five large rooms comprise the bedrooms, each equipped with six bunks containing innerspring mattresses, individual reading lamps, and electric sockets. Five large windows admit light during the daytime, and provide good ventilation, while Venetian blinds permit control of lighting and also enhance the appearance of the rooms. Hardwood flooring is used throughout, and only oil mops are used to clean the floors. Each room has four steam heaters which produce sufficient heat for comfort during the severest winter weather. Walls and ceilings are made of plywood, and each person has an individual table at the head of his bed.

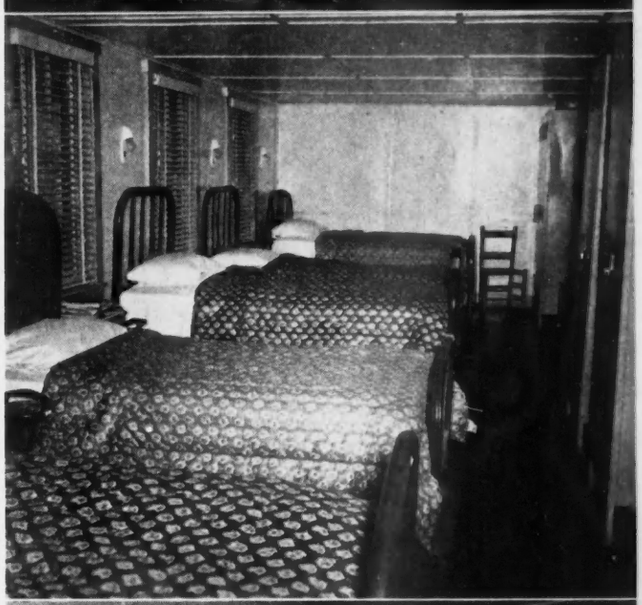
Also located on the dormitory deck is a large bathroom which contains modern fixtures and sufficient equipment to accommodate crews just off the job and having the universal desire to clean up with little delay. The bathroom is maintained in a manner to meet the requirements of the most exacting sanitation inspector, with its tile floor and porcelain fixtures frequently scrubbed.

A central corridor about five feet wide extends the length of the upstairs deck, with doors opening into the bedrooms. Floor of the hall is covered with inlaid linoleum to muffle noises for the benefit of the off-job crews, some of whom sleep during the daytime, while adequate ventilation is provided by two fans which pull air through grates in the ceiling of the corridor. As a further measure to assure good ventilation, all doors opening into the hall are equipped with louvers to facilitate drawing air through the open windows. A drinking fountain containing ice water is located in the corridor in a convenient site.

Humble's quarterboat operates as a self-sufficient unit, capable of sustaining itself over indefinite periods by means of large storage space for fuel, food, and drinking water, which are the main items transported from the outside. With an ample supply of these necessities on hand, the quarterboat is independent, with all facilities for providing essentials for comfort and welfare being aboard the barge.

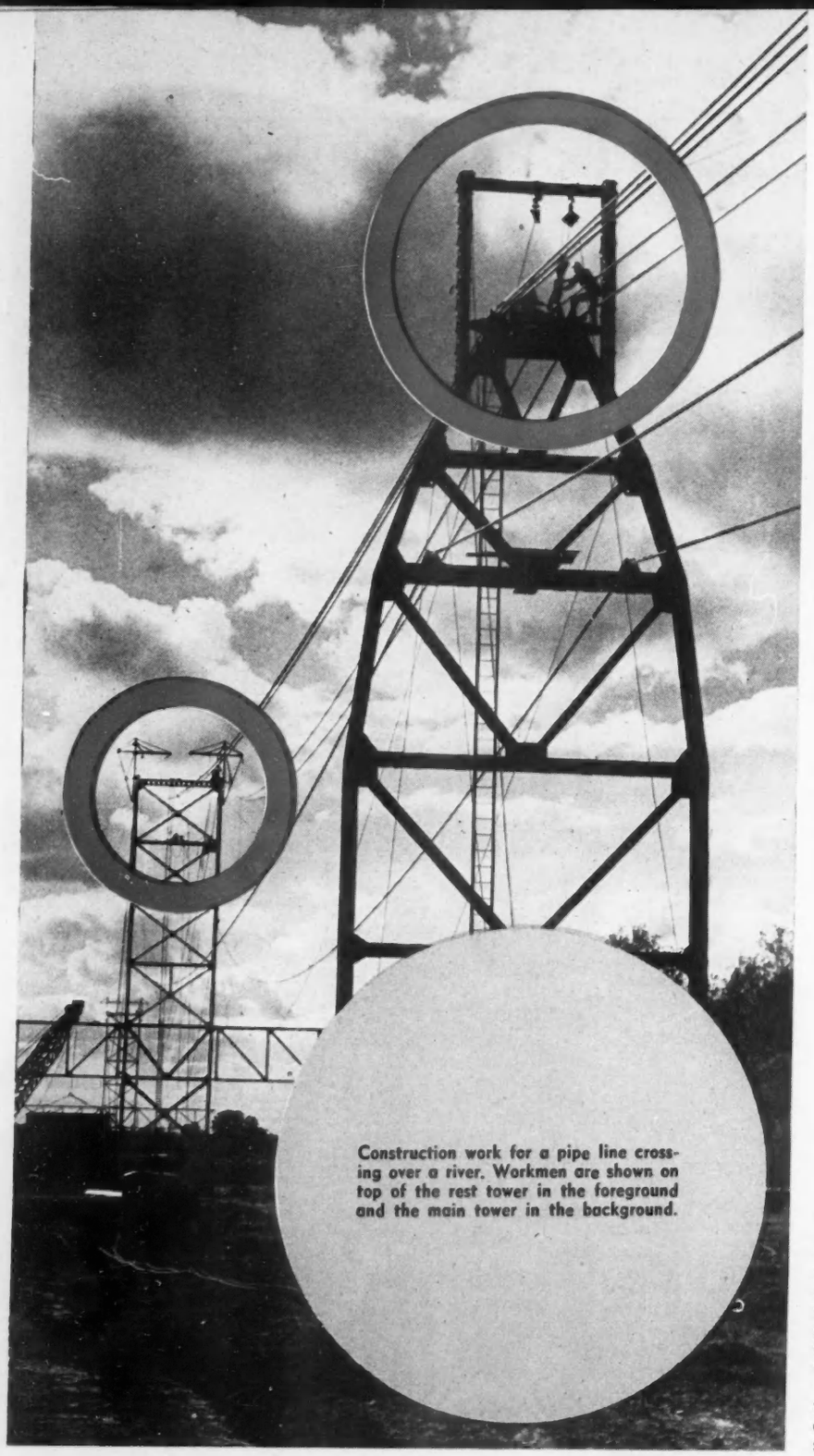


Light plant for the quarterboat includes two diesel engines driving generators, located in the basement below the main deck. Also below deck is an automatic boiler for steam-heating the boat, electric water cooler, septic tank, and cold storage room.



Main dormitory is located on the second deck, and consists of five large rooms, each equipped with six beds. Reading lights, bed tables, and steel lockers are provided for each man, and Venetian blinds are used throughout. Kitchen personnel live in a separate downstairs room, and a guest room accommodates visitors.

A spacious upstairs lavatory furnishes all-modern fixtures including showers, wash basins, and commodes. Hot and cold running water are always available. Smaller bathrooms are provided for the cook and guest rooms.



Construction work for a pipe line crossing over a river. Workmen are shown on top of the rest tower in the foreground and the main tower in the background.

FUNDAMENTALS OF INDUSTRIAL *Accident Prevention*

By C. L. HIGHTOWER, Safety Director,
United Gas Pipe Line Company and Union Producing Company

Part 4

Safety Committees

MANY organizations have found the committee plan of accident prevention to be highly successful. It seems to be particularly well adapted to the very large plant where many workmen are concentrated at one location, and where operations and time schedules are such that it is not practical to hold group or general safety meetings at regular intervals.

Medium size and small plants have also used the plan with good results. The plan of organization is simple and the structure flexible enough so that the type and size of committees and the scope of their work can be adjusted to meet the needs of a large organization or to serve the small plant equally as well.

Following is a suggested plan of committee organization with a list of the various functions of some of the basic committees:

General Safety Committee

The General Safety Committee should have general control over the safety program and should be charged with establishing safety policies and approving methods of inspection, investigation and training.

A. The personnel of the committee should be composed of the following:
   - Operating executive, chairman
   - Plant manager
   - Safety director
   - Chief engineer
   - Purchasing agent
   - Operating foreman
   - Maintenance foreman
   - Medical director
   - Industrial nurse
   - Chairman of Inspection Committee
   - Chairman of Safe Practice Committee.
   - Chairman of Accident Investigation Committee

Anyone of the group may serve as secretary, or the secretary to the operating executive may serve in this capacity. The important thing is to have a secretary to keep an accurate record of the minutes of all meetings and to follow up on recommendations and suggestions submitted by the sub-committees or employees and see that action is taken.

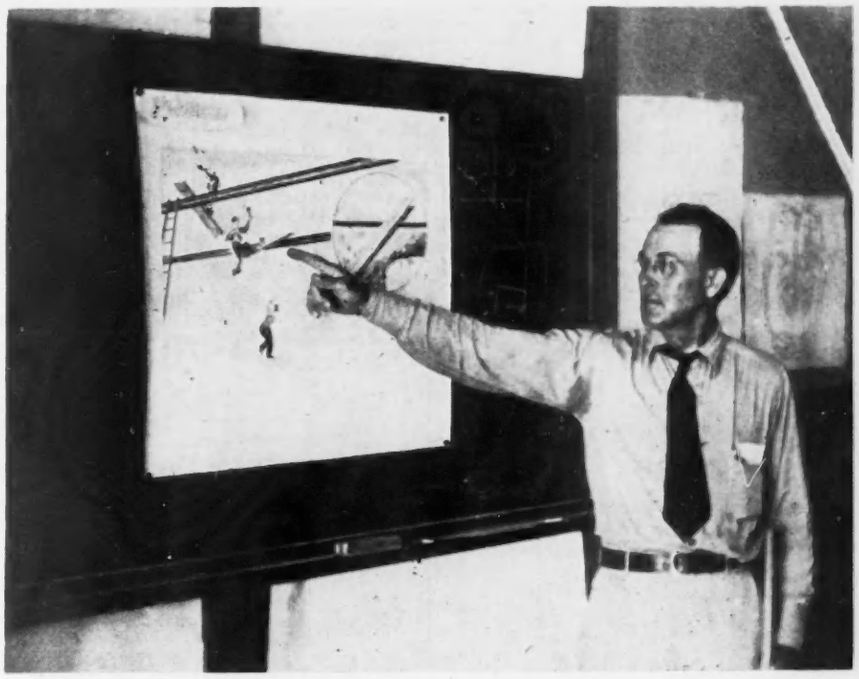
It is not usually advisable to rotate the membership of this committee except as the chairmen of the different sub-committees change, but to retain as members the chief department heads and foremen. The smaller plant, of course, will not likely have a safety director, medical director, purchasing agent or industrial nurse, but where the operation is sufficiently large and such positions exist, these people should serve on the committee.

B. This committee should meet at least once each month, at a regular time and place, and a regular schedule of business should be followed in conducting the meeting.

C. The duties of this committee may include:
   1. A review of the accidents reported since the last meeting with the view of determining the cause and remedial measures that should

be taken to prevent a recurrence.

2. Discussion of the report of the Inspection Committee and consideration of ways and means of correcting any physical hazards reported.
3. Consideration of the recommendations of the Safe Practice Committee.
4. Review the methods being employed for releasing and displaying safety material, and determine whether or not bulletin board displays, payroll enclosure, distribution of reports of accidents, and other propaganda mediums might be instituted or improved upon if already being used.
5. Review job training methods to to determine whether the training procedure is sound and if safe practices are included as a part of the training course.
6. Consider the need for mechanical guards or personal protective equipment in order to overcome any hazards brought to light by accidents which have occurred or through the efforts of any of the sub-committees.



The use of visual educational material is shown by this picture of a speaker at a compressor station safety meeting. The poster being used illustrates a "no injury" accident which occurred when an employe used a defective board as a scaffold platform.

Inspection Committee

It should be the responsibility of the Inspection Committee to make periodic inspections of plant properties, tools and equipment. The type of operations and nature of the equipment used will determine the frequency with which inspections are to be made, but as a general rule, once per week is not considered too often. In addition to physical hazards, a check should be made of work procedures to determine whether or not unsafe practices are being followed. Members of the committee will find it helpful to use a "check list" in making their survey of the different departments and operations. Such a list insures that nothing of importance will be overlooked.

Following are some of the items the committee should check:

1. Hand tools such as chisels, hammers, screw drivers and wrenches for "mushroomed" heads, defective and broken handles, spread jaws and dulled cutting edges.

2. Stairways, walkways and above-ground platforms for adequate lighting, absence of or defects in guard rails and toe boards, broken or worn floor boards or stair treads.

3. Moving machinery for unguarded gears, shafts, belts, cutting edges, and proper operation of automatic controls.

4. Elevators for proper operation of doors, block gates, and condition of cable, car floor and walls.

5. General housekeeping conditions for stumbling hazards, improper placement of tools and equipment, loose rubbish and improper stacking or piling of materials.

6. Fire protection equipment to determine that same is properly placed, can be readily identified, is charged and ready for use.

7. Electrical wiring, motors, tools and appliances for exposed or frayed wiring and proper grounding.

8. Overhead cranes and hoisting equipment to determine condition of track, cables and proper operation of control devices.

9. Condition of floors and ramps to determine whether or not there are holes, broken boards or other defects that could cause stumbling or falling hazards.

10. Lighting of aisles, work benches and other locations to see that no hazard exists because of improper lighting.

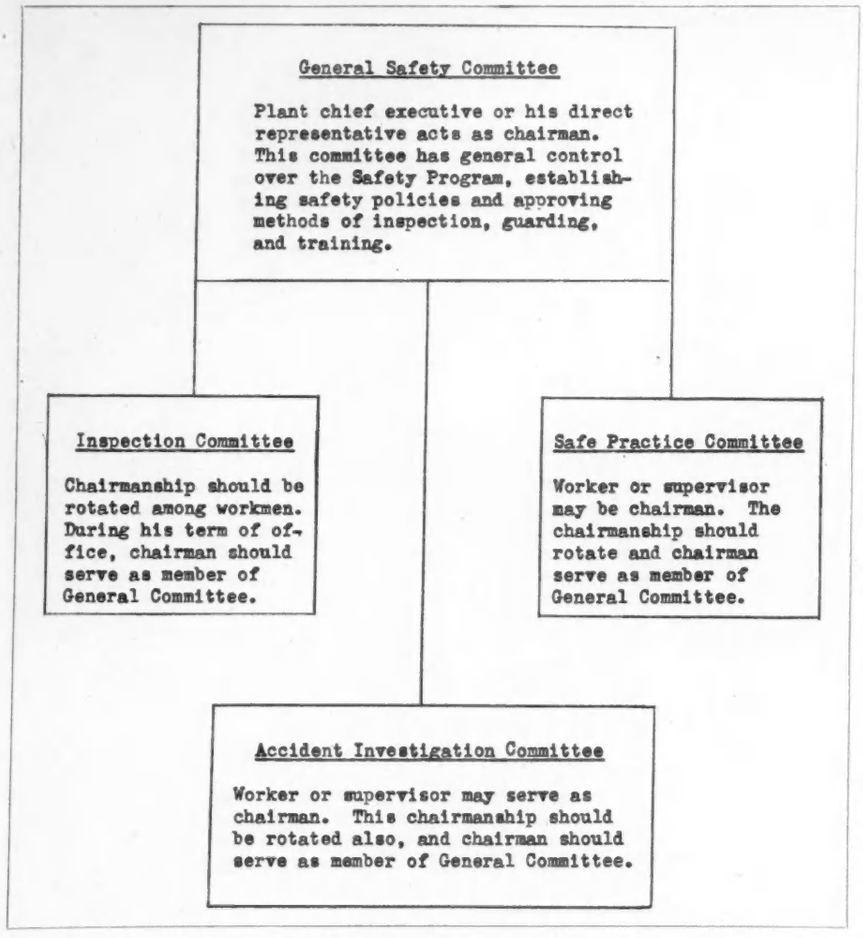
11. First aid kits to see that they are adequately filled and that materials are sterile and ready for use.

12. Observe work procedures to determine whether or not any of the following unsafe practices exist:

   a. Horseplay
   b. Working with undue haste
   c. Taking unnecessary chances
   d. Using wrong type of tools
   e. Improper lifting
   f. Attempting to lift too great a load
   g. Standing under raised loads
   h. Leaving tools or materials on platforms or other above ground levels
   i. Lack of coordination between workmen
   j. Working without personal protective equipment
   k. Wearing unsafe clothing
   l. Working above ground without use of safety belt
   m. Attention distracted by unnecessary talking or from other causes.

In their tour of inspection the committeemen should call to the attention of the foreman in charge of any unsafe condition or practice observed so the foreman can, if possible, take immediate steps to correct the hazard before an accident occurs. The committee's report should then indicate that the condition was called to the attention of the foreman and state what action, if any, was taken to remove the hazard. Such a procedure not only enables the foreman to give immediate attention to accident-causing conditions in his department, but it establishes a close relationship and promotes harmony and cooperation between operating supervisors and the

Meter inspector tightening a diaphragm case on a regulator, illustrating the need for selecting the proper size wrench and fitting it securely to the nut before starting the turn.


General Safety Committee
Plant chief executive or his direct representative acts as chairman. This committee has general control over the Safety Program, establishing safety policies and approving methods of inspection, guarding, and training.
Inspection Committee
Chairmanship should be rotated among workmen. During his term of office, chairman should serve as member of General Committee.
Safe Practice Committee
Worker or supervisor may be chairman. The chairmanship should rotate and chairman serve as member of General Committee.
Accident Investigation Committee
Worker or supervisor may serve as chairman. This chairmanship should be rotated also, and chairman should serve as member of General Committee.

Safety Committee organization chart.

committeemen, making their work easier and more effective.

A written report of each inspection with a detailed list of unsafe conditions and practices found, together with the committee's recommendations for their correction, should be submitted to the General Safety Committee. Serving as a member of the General Committee, the chairman of the Inspection Committee will have an opportunity to sit in on the discussion of his committee's report and to offer additional comments and explanations on the need for the corrective measures recommended.

This committee should be made up of workmen, and the membership should be rotated to provide an opportunity for all employes to serve, and in this way make their contribution to the cause of safety in the plant. The Inspection Committee usually consists of three members who serve a term of three months. The terms should be alternate so that one new member would be elected each month, and insuring that there will be two experienced committeemen in office at all times. The oldest member in point of service on the committee usually serves as chairman.

The Safe Practice Committee is charged with the responsibility of developing safe practice suggestions for thevarious jobs in a department. It is usually composed of both supervisors and workers who serve for periods ranging from six months to a year. Members are appointed by the chairman of the General Safety Committee, and the Safe Practice Committee's assignments are made by the General Committee. Information developed by this committee is submitted to the General Safety Committee, and after review and final approval by this body, is released as safe practice guides, pamphlets or rule books. These guides or rule books serve as the basis for instructing new workers, and they are also beneficial as study material or discussion outlines for employe safety meeting groups.

The committee may develop material for safe practice guides from the following sources:

1. Study of accident reports.
2. Observation of existing work practices to determine whether or not unsafe practices are being followed.
3. Study of inspection committee reports.
4. A review of safe practice pamphlets or rule books of other concerns engaged in the same or a similar line of work.

Accident Investigation Committee

As its name implies, the duty of the Accident Investigation Committee is to investigate and report on the accidents which occur in the plant or department over which the committee has jurisdiction.

The personnel of the committee may be composed of from three to five persons, depending on the size of the plant or department, and the number of different operations involved. Preferably the committee should be made up of both workers and supervisors. On a three-man committee, one supervisor and two workers make a good combination, while on a five-man committee a ratio of three workers to two supervisors is best. Members of this committee are usually appointed by the chairman of the General Safety Committee, and the term of office may vary from one month to a year. It is considered advisable to have the terms alternate to insure that there are at least two experienced committeemen in office at all times.

The personnel of this committee should be impressed with the fact that the purpose of investigating accidents is not to fix the blame on someone, but rather that it is a fact-finding body who's job it is to determine the cause of accidents so that proper steps can be taken to remove the condition or practice responsible and avoid a recurrence. If the plant personnel gets the impression that the committee's aim is to hunt down someone for the purpose of fixing the blame for accidents, its usefulness is destroyed.

In making its investigation, the committee should request the foreman under whose jurisdiction the accident occurred to assist them in learning the facts and circumstances surrounding the accident. The foreman is certainly entitled to this courtesy, and by reason of his knowledge of the work and the worker, he can be relied upon to supply the most reliable information, and to offer the most constructive suggestions provided he is approached in the proper manner, and his faith and confidence in the committee is firmly established.

The committeemen should first go over the report of the accident submitted by the foreman and discuss with him the source of his information on how the accident occurred and what caused it. They should then look over the work place where the accident occurred and examine any tools, equipment or materials involved. The injured or any witnesses may also be questioned and asked to give their version of what happened. After collecting all available facts, it is then advisable for the committee to sit down with the foreman involved and, if possible, agree on what happened and what recommendations should be made to correct the offending cause. If the committeemen cannot agree with the foreman on the circumstances of the accident, they should tell him what their opinion is and what recommendations they plan to submit to the General Safety Committee. In this way there will be no misunderstanding as to the committee's intentions or its methods.

Often the committee is furnished an investigation form for its use in reporting its findings and submitting its recommendations, and in other instances it is required to submit a report in narrative form. How the report is made is not so important. The important thing is that a thorough investigation of the facts is made, that definite conclusions are reached and recommendations made, and finally, that the report is considered by the General Safety Committee and is disposed of in the same manner.

Variation in the size of an organization and in the types of operations may make it necessary or advisable to appoint other standing committees and special problems which may arise from time to time might indicate the need for temporary committees.

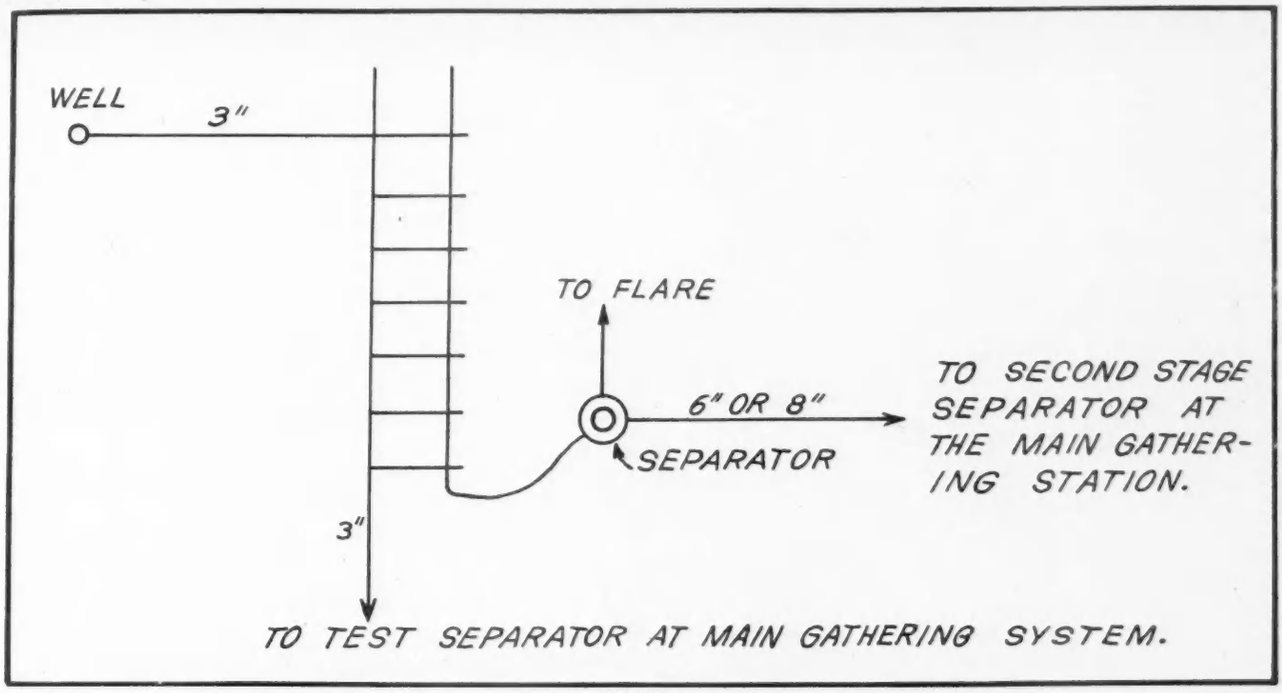


FIGURE 1

Evaluation of Gathering Systems

By GEORGE DE MOHRENSCHILDT
Petroleum Geologist and Engineer, Caracas, Venezuela

IN THE evaluation of a gathering system many aspects have to be considered and a purely mathematical answer usually cannot be found. Several of these aspects will be discussed here and the way tentatively set for finding the answer to the problem of efficiency of a gathering system.

Assume a simple gathering system: Wells singly or doubly completed connected to manifolds and separators by three-inch lines. Figure 1 indicates the setup at the manifold. A three-inch test line can be used to test the well periodically, in which case the well production flows directly through this line to the test separator and test tank located at the main gathering station.

Assume also that the production has been up to now flowing, and that all the wells have been connected to the same gathering system, consisting of several manifolds and separators connected by six and eight-inch lines to the main gathering station where second stage separators are installed. No differentiation is made between wells of different characteristics, the system having been developed rapidly. This simple gathering system worked well when the field was young but the day came when it became necessary to study the efficiency of such a simple system and replace it by a different one. It, is, by the way, the usual procedure in foreign fields, where simple systems are necessary owing to the shortage of line material and trained personnel. So the problem at hand is important: replacing the existing system or parts of it by a low-pressure gathering system, change position of manifolds and tanks, change lines, put some wells on gas-lift and some on pump or decide on several other solutions.

Information Needed

The simplest way to attack the problem is to collect the following information:

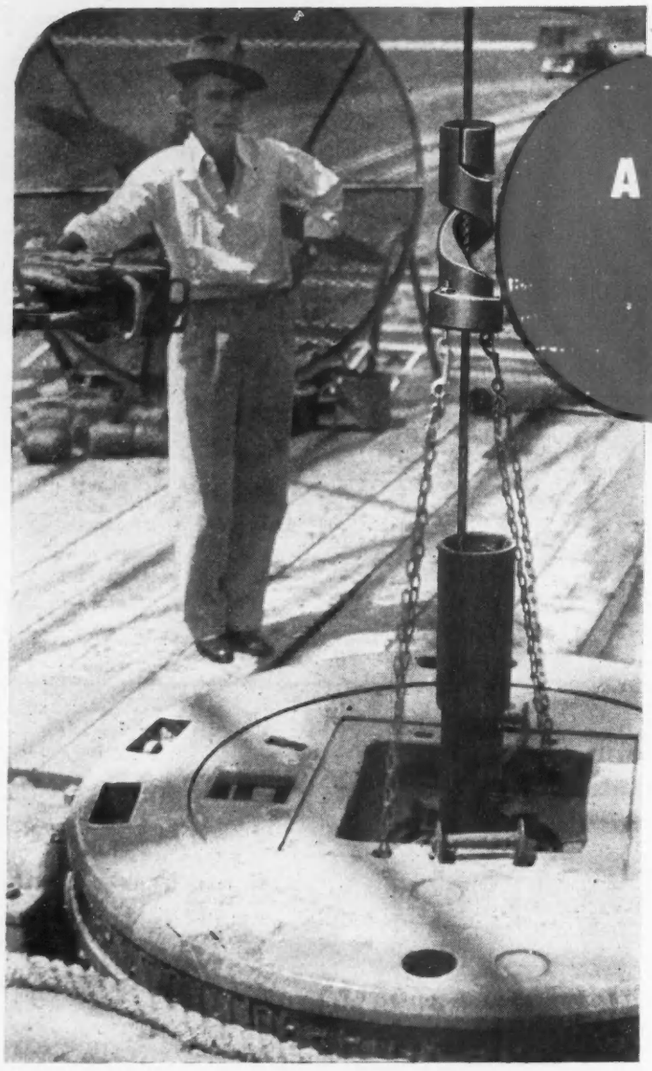
1. Initial potentials of the wells.
2. Initial tubing and casinghead pressures.
3. Present tubing and casinghead pressures.
4. Accumulated production.
5. Latest daily production.
6. Condition of the well.
7. Core analysis information concerning permeability and porosity of the productive sand and characteristics of the fluid.
8. Geological information concerning composition of the sand, thickness of the sand, size of the reservoir, faults, etc. . . .
9. All the other pertinent information concerning the status of the well, the way it had been produced, and so on.

On the basis of this information a fairly clear picture may be seen and a decision may be taken concerning individual wells. Some of them may be switched to a low-pressure gathering system, the others put on a gas-lift or on a pump. Mechanically deficient wells may be repaired and reservoir conditions of others may be changed by the process of shooting or acidizing. Some wells may just be abandoned if the estimated production is not sufficient to warrant the expense.

In addition to the information indicated above, calculations of capacity and efficiency of the existing gathering system should be made. These calculations should have been made during the planning of the system, but if it has been devised haphazard in the emergency, as it is often the case in a new area or in the conditions of fast competitive drilling, they may be made later. Assume that ours is a haphazard, emergency system. Its deficiency has been found owing to the disparity between the added test production of all the wells and the actual production of the field.

The problem consists thus in finding out which part of the gathering system offers the greatest resistance to the flow of fluid and when it is found the deficient part has to be urgently changed.

Actual tests of pressure along the lines can be made in the field, but often this procedure is not followed and the case will have to be treated as a mathematical problem. This simple problem of hydraulics is often complicated by the lack or deficiency of vital information as to the condition of the pipe or as to the viscosity of the fluid flowing



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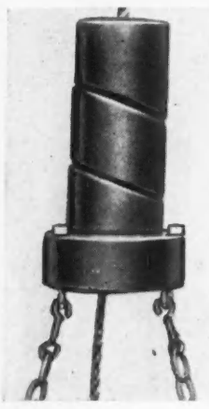

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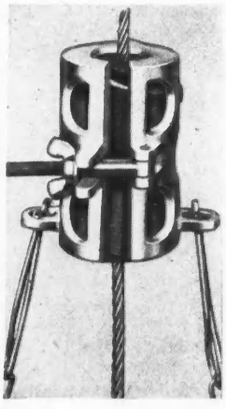

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from the wells to the manifolds and separators. If tests of viscosity of the gas and oil mixture have been made, such a viscosity can be used in calculations while keeping in mind that it may widely differ from well to well and in the same well from hour to hour. Also, correction should be made for the average temperature in the field.

But if no test of viscosity have been taken (we assume such a case) then the tank oil viscosity can be used for the calculation of resistance in the main six and eight-inch lines (from separators to the gathering station) but such a procedure will often lead to absurdly high resistance figures. A more plausible assumption would be that gas alone flows through the lines. Also, gas-oil ratio being known in individual wells, the approximate viscosity of the mixture can be found in the available literature. Finally, the simplest way for solving the problem of this relative resistance would be to assume that water flows through the system. As far as the condition of the pipe is concerned, information has to be gathered in the field and a factor introduced in the calculations.

Making Tabulations

First of all, a tabulation should be made of all the information available which will be needed in calculations. If there is a great number of wells, a neat and logical tabulation will facilitate and accelerate the solving of the problem. A separate tabulation is suggested for tests and production, although some of the data will coincide.

In the production tabulation a definite schematization is suggested; data should be posted separately for each manifold and within these divisions separate columns may be set as follows:

A. Number of the well connected to the manifold. Information carefully checked in the field.

B. Tubing head and casinghead pressures. If such data are not available, test data may be used.

C. First stage separator pressure.

D. Difference of pressure between well head and first stage separator.

E. Difference of elevation between the top of the oil line and the first stage separator (in feet). Favorable difference of elevation for the flow of fluid may be recorded in black, unfavorable in red.

F. Calculated head of oil, gas, mixture of oil and gas or water due to the difference of elevation recorded in "E".

G. Differential pressure is recorded in "D" plus calculated head recorded in "F".

H. Latest daily production obtained from the available reports. A separate sub-column may be given to the production from the casing if there is only one gathering line and a separate column, of course, if the production flows through a distinct line.

I. Choke.

J. Latest status of the well.

K. Effective length of three-inch gathering line.

Additional information should be obtained and calculations made; but these do not require a separate column:

1. Differential pressure between the first and second stage separator plus calculated head of fluid due to the difference of elevation.

2. Effective lengths of six or eight-inch lines from the first stage separator to the second stage separator or to the main gathering station. If different sizes of pipe are used in the same line, they should be brought to one size by the use of the formula $L_1 = L\frac{(D_1)^5}{(D_2)}$

Test Tabulation

For the "test tabulation" a similar schematization may be suggested. It should be kept in mind that usually there will be only one test separator and only one line connecting the well to the separator through the manifold.

After the tabulation has been made, calculations of resistances may proceed by the use of formulas known to engineers. The author would suggest a time-saving device for calculations and the eventual elaboration of a curve from which needed information may be obtained with minimum effect.

Assume that the natural gas is flowing through the system. The problem will consist of the following steps:

1. Finding the specific gravity of gas referred to water or air, depending on the formula used (we used specific gravity referred to water).

2. Finding of the factor for the flow through the three-inch line. This factor when multiplied per volume of fluid in cubic feet per day, will give the velocity of flow in feet per second.

3. Finding of the friction factor for isothermal conditions. It is a function of Reynold's criterion and its value may be calculated in different ways, using information found in the available literature. In calculating the friction factor one should keep in mind that velocity being the only varying member of the equations, a numerical factor should be introduced which will simplify the calculations.

4. Having all the data Fanning's equation is applied:

$$\frac{\Delta P_f =}{\frac{0.323 f s u^2 L}{D}}$$

where: ΔP_f = pressure loss, lb. per sq. in. pipe, ft.
S = specific gravity referred to water
u = velocity, ft. per sec.
L = equivalent length of pipe.
D = diameter of pipe, in.
f = friction factor
z = absolute viscosity centipoises.

Since the varying factors for each particular case are f, u^2 and L they are eliminated from Fanning's equation and the other members are converted into a factor "x" by which f, u^2 and L have to be multiplied in order to find the pressure drop ΔP_f.

Several detailed calculations, simplified as indicated above, should be made for representative cases covering the range of smallest to largest volumes of gas flowing from the individual wells (or zones). Then a curve may be plotted which will simplify the procedure if many wells (or zones) are connected to the gathering system. Volumes of gas in thousands of cubic feet per day are plotted on semi-log paper against

$$\frac{0.323 f s u^2}{D}$$

The results, read directly from the graph, may be used for the other wells with sufficient precision and also for the future cases if we assume that the basic facts and assumptions remain unchanged. Through the use of this graph a great saving of time is effected, as the calculations of the drop of pressure are very tedious.

The results obtained in calculations of pressure losses will give a definite indication as to the efficiency of each three-inch line and as to the efficiency of production lines as compared with the test lines. The difference of pressure at the choke during production may be expressed as a percentage of the difference of pressure at the choke during tests. Such a percentage may be considered as a measure of the efficiency of the system and leads the engineer to the definite recommendations. Yet all the factors mentioned in the first part of this article should be considered carefully and compared with the results obtained by calculations.

May Production Highest Since Final War Month

Domestic crude production in May reached the highest level since August, 1945, attaining a daily average of 4,785,000 barrels, an increase of 112,000 barrels over April, 80,000 barrels of which came from Texas, it is shown by the monthly statement of the Bureau of Mines.

Oil-well completions during the month totaled 1302, 66 more than in April and 156 more than in May, 1945, but the number of drilling rigs active at the close of the month was 3562, a drop of 57 from April 30 and 368 fewer than on the same date last year.

While production increased 112,000 barrels daily, demand for domestic crude advanced 155,000 barrels, to 4,797,000 barrels, requiring withdrawals from domestic crude stocks of 12,000 barrels a day. Total crude stocks, foreign and domestic, dropped to 226,505,000 barrels on May 31 from 227,013,000 barrels April 30, the bureau reported.

Crude runs to stills also were up, gaining 131,000 barrels daily to average 4,794,000 a day in May. Total refined stocks increased 4,900,000 barrels during the month to a total of 237,507,000, with stocks of finished gasoline dropping 4,600,000 barrels and stocks of residual fuel oil increasing 3,700,000 barrels, distillate fuel oil 1,800,000 barrels, kerosine 1,700,000 barrels and unfinished oils 2,400,000 barrels. Total demand for motor fuel was 69,800,000 barrels against 65,600,000 in April, and the yield of gasoline from crude rose from 38.5 to 38.8 percent for the month.

Domestic Production

Domestic production in May included 148,334,000 barrels of crude against 140,196,000 in April; 9,379,000 barrels of natural gasoline against 9,073,000 and 150,000 barrels of benzol, unchanged, a total production of 157,863,000 against 149,419,000 which, with imports of crude of 7,508,000 barrels against 7,466,000 and refined products of 4,667,000 barrels against 2,299,000, gave a total new supply, all oils, of 170,038,000 barrels against 159,184,000.

Total demand was 165,599,000 barrels against 156,751,000, including exports of crude, 3,614,000 barrels against 3,618,000, and refined products, 10,312,000 barrels against 9,866,000, and domestic demand for motor fuel, 66,774,000 barrels against 5,995,000; distillate fuel oil, 18,297,000 barrels against 18,063,000; residual fuel oil, 39,346,000 barrels against 37,911,000; lubricating oil, 2,866,000 barrels against 3,061,000; wax, 197,000 barrels against 201,000; coke, 752,000 barrels against 784,000; asphalt, 3,499,000 barrels against 3,051,000; road oil, 397,000 barrels against 194,000; still gas, 7,553,000 barrels against 7,158,000; miscellaneous, 3,579,000 barrels against 3,320,000, and losses 2,075,000 barrels against 1,484,000.

Stocks Shown

Stocks at the close of May included 221,592,000 barrels of gasoline-bearing crude against 222,480,000 April 30; 4,913,000 barrels of heavy crude in California against 4,533,000; 7,004,000 barrels of natural gasoline against 6,982,000, and 237,507,000 barrels of refined products against 232,582,000, a total, all oils, of 471,016,000 barrels, or 88 days' supply, against 466,577,000, or 89 days' supply.

"FINGER-PRINT" OF A POSSIBLE OIL AREA

ACCURATELY DETERMINED BY EXPERIENCED CREWS...CARRYING OUT A PLANNED PROGRAM

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Wildcatting Declines But Upturn Expected

EXPLORATORY completions averaged 81.8 wells per week during the first seven months of this year, a decrease of 1 percent from the 82.6 average of the corresponding period of 1945. Wells completed in the two comparable periods totaled 2454 and 2479 respectively.

The lack of ample tubing supplies has aided in retarding this year's exploratory drilling and caused it to trail last year's slightly, but the gradual easing of this shortage, together with the recently posted crude price increase, should prove a spur to this program. A sharp step-up in drilling would prove 1946 to be a record-breaking wildcat year.

While this year's total exploratory completions are less numerous than those of the previous year, the ratio of producers to dry holes holds some advantage. To date, 21.4 percent of the wells have produced against 18.9 percent productive for the comparable seven months of last year.

This year has netted 284 new sources of oil against last year's 265, an increase of 7.2 percent. These oil finds compared with the preceding year are 165 new fields against 178, and 119 new pay horizons in existing fields against 87. Extensions to proven oil fields total 93 compared to 98 last year.

Distillate discoveries, more numerous by 44 percent, total 39 against 27 for last

Summary of Results of Exploratory Drilling

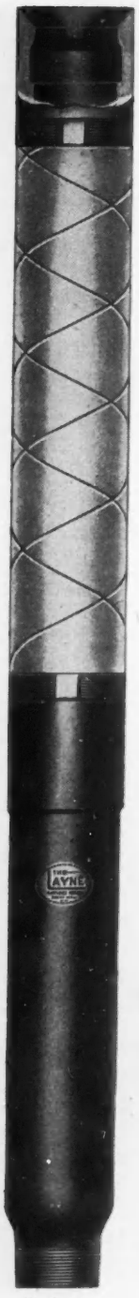
ITEM	July, 1946	June, 1946	Seven Months Jan.-July 1946	1945	Percent Diff.
Oil Discoveries	39	43	284	265	+ 7.2
New Fields	19	28	165	178	— 7.3
New Pays	20	15	119	87	+ 36.8
Distillate Discoveries	4	2	39	27	+ 44.4
New Fields	3		19	19	
New Pays	1	2	20	8	+150.0
Gas Discoveries	10	10	77	62	+ 24.2
New Fields	7	8	58	52	+ 11.5
New Pays	3	2	19	10	+ 90.0
Total Discoveries	53	55	400	354	+ 13.0
Extensions to Fields	15	18	124	115	+ 7.8
Oil Fields	12	17	93	98	— 5.1
Distillate Fields			4	5	— 20.0
Gas Fields	3	1	27	12	+125.9
Total Prod. Tests	68	73	524	469	+ 11.7
Dry Holes	283	284	1,930	2,010	— 4.0
(Weekly Average)	70.8	71.0	64.3	67.0	— 4.0
Wildcats	277	279	1,885	1,960	— 3.8
New Pays	3	3	27	27	
Outposts	3	2	18	23	— 21.7
Total Expl'tory Tests	351	357	2,454	2,479	— 1.0
(Weekly Average)	87.8	89.3	81.8	82.6	— 1.0
Percent Productive: (Weekly Average)	19.4	20.4	21.4	18.9	
Percent Dry: (Weekly Average)	80.6	79.6	78.6	81.1	

Dry hole completions are from weekly reports and totals represent completions for 4 weeks in July, 1946; 4 weeks in June, 1946; 30 weeks in Jan.-July, 1946; 30 weeks in Jan.-July, 1945.

Results of Exploratory Drilling in July and First 7 Months, 1946-1945, by Districts

State or District	MONTH OF JULY, 1946													FIRST SEVEN MONTHS 1946																
	Productive Tests									Unproductive Tests			Total Exploratory Tests	Productive Tests									Unproductive Tests					Total Exploratory Tests	
	New Fields			New Pays			Extensions			Total Productive																				
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.		Wildcats	New Pays	Outposts		New Fields			New Pays			Extensions			7 Mo. 1946	7 Mo. 1945	Wildcats	New Pays	Outposts	Total Dry 7 Mo. 1946	Total Dry 7 Mo. 1945	7 Mo. 1946	7 Mo. 1945
															Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.								
Alabama																							1			6			6	11	6	12
Arizona																										1			1		1	
Arkansas	1									1	5			6	2			1			1			4		24		1	25	28	29	28
California		1								1	14			15	3	3		4			6	3		19	11	135			135	167	154	178
Colorado				1						1	2		1	4				1			3			4	5	8	1	1	10	2	14	7
Florida											4			4							1			1		14			14	9	15	9
Georgia																										2			2	6	2	6
Illinois				6			6			12	39			51	10			18			25			53	57	256			256	211	309	268
Indiana							1			1	9			10	4	1		3			4			12	7	36			36	63	48	70
Iowa																														1		1
Kansas	3			1			2	1		7	24			31	26	4		3			17	2		52	51	138			138	189	190	240
Kentucky											8			8	2	2		3			3			10	9	44			44	42	54	51
Louisiana	1	1	1	4		1				8	15			23	13	3	4	20	2	7		2		51	41	104	1	1	106	84	157	125
North Louisiana			1							1	7			8	5	2	2		1	2		1		13	13	61	1		62	50	75	63
South Louisiana	1	1		4		1				7	8			15	8	1	2	20	1	5		1		38	28	43		1	44	34	82	62
Michigan	1									1	18			19	9	2	1		3		5	1		21	13	126		2	128	125	149	138
Mississippi											5			5	1	1				1		1		4	6	35			35	71	39	77
Missouri											4			4												11			11	11	11	11
Montana											2			2				2						2	6	10			10	6	12	12
Nebraska																														3		3
New Mexico											5			5				2			2			4	8	29	2		31	37	35	45
New York																										1			1		1	
North Carolina											1			1												1			1		1	
Ohio											4			4	1	8					1	10		20	17	23			23	36	43	53
Oklahoma	5	3					1	1		10	20			30	38	13	1	5	5		9	2	1	74	63	130			130	175	204	238
Oregon																										2			2		2	
Pennsylvania											1			1		2								2		2			2		4	
Tennessee																										2			2	1	2	1
Texas	8	2	2	8	3		1	1		25	94	3	1	123	53	15	12	56	8	12	14	5	3	178	163	731	23	12	766	719	944	882
E. Texas Border															3	3	1	1				1		9	2	3			3	10	12	12
Rest of E. Texas											5			5	2		1	1			1	1		6	5	48	2		50	43	56	48
North Texas	4			2						6	25			31	20	1		9			1			31	28	210	4		214	176	245	204
West Central Texas				3						3	12	1		16	8	2		8						18	17	96	4	1	101	77	119	94
West Texas		1		1						2	12	2	1	17	5	4		12			7			28	34	80	8	5	93	135	121	169
Panhandle											2			2												11	1		12	6	12	6
Upper Gulf Coast	2									2	6			8	5		3	16	3	6	3	1	2	39	35	70	1	3	74	79	113	114
Lower Gulf Coast			2	1	1			1		5	9			14	2	1	7	7	2	6		2	1	28	32	86	2	2	90	102	118	134
Southwest Texas	1	1		1	1		1			5	13			18	2	4		2	2		2			12	8	76		1	77	65	89	73
South Central	1				1					2	10			12	6				1					7	2	51	1		52	26	59	28
Utah															1									1		1			1		2	
Washington																										1			1		1	
West Virginia																3								3		4			4		7	
Wyoming							1			1	3		1	5	2	1	1	1	1		2	1		9	11	8		1	9	13	18	24
Total U. S.	19	7	3	30	3	1	12	3		88	277	3	3	351	165	59	19	159	19	30	93	27	4	524	469	1995	27	18	1930	2010	2454	2479

When You Use THE LAYNE "TUBING SET" Packer



Packer

ONE TRIP DOES THE WORK OF TWO

If you prefer to set Screen—liner Packer with tubing—then here is the Packer you should use. It will save you the time and expense of coming out with the setting tool. Extremely flexible, this hook-up can be used with any make or type Tubing Head or Christmas Tree.

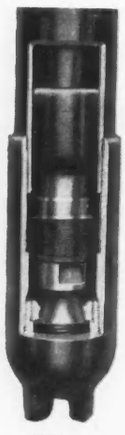
The Set Shoe, Screen, Liner and Packer are run in the casing with the tubing connected in the set shoe and not the packer.

When the setting is on bottom and screen washed on the outside twelve turns to the right, plus any additional make-up of tubing, closes the valve and releases tubing from the shoe.

After the screen is washed on inside, the string of tubing is raised sufficiently to allow the collapsing tool segments to expand in recess at top of packer. The packer is then set in the usual manner and the tubing hung at the desired place.

Collapsing Tool

Letting in Tool



Tubing Set Shoe

Due to the Layne specially designed means of creating a hard canvas pack, this packer has 36" of canvas wrapping and it sets with the sleeve down. A suitable cap fits on tubing and rests on top of packer to keep sand, etc., from inside of packer.

☆

Write for complete information on the Layne Packers and Screens.

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900 Santa Fe Ave.,
Los Angeles, Cal.

year. These distillate sources include 19 new fields against the same number for last year, and 20 new pays compared with eight. Distillate field extensions amount to four against five for last year's comparable period.

This year's new gas finds compared with last year's are 58 new fields against 52, and 19 new pay horizons against 10, for a total of 77 new strikes against 62. Gas field extensions number 27 compared to the previous period's 12.

Fewer Dry Tests

There have been 1930 dry tests drilled this year against last year's 2010 nonproducers, a drop of 4 percent. Of this total, 1885 were strict wildcats against 1960. Efforts to find new producing strata in existing fields proved unsuccessful in 27 cases during each period. Attempts to extend field boundaries by at least ½ mile resulted in 18 dry holes so far this year against 23 dusters last year.

As compared with June, exploratory efforts in July slumped slightly. Against a total of 357 tests drilled in June, July showed 351. However, the difference between these two months in 1945 was considerably larger, as June showed 396 test wells drilled against 360 for July.

During July, Arkansas gained an oil field in Lafayette County, out of six exploratory wells. California, out of 15 tests, netted a gas field in Butte County.

A new pay horizon was located in the Rangely field to give Colorado its only successful well out of four completions. The only other producer in the Rocky Mountain district was a well that extended oil production a mile east of the Big Muddy field, Converse County, Wyoming.

Six new oil field pay horizons were found and six oil field extensions were made in Illinois during the month, as a result of 51 exploratory completions. Out of ten trials Indiana extended production in its Posey County's Farmersville oil field a mile south.

Kansas added three oil fields, one of which, in Stafford County, appears important. Kansas also discovered a new oil pay in a Rooks County field, and extended production in one gas and two oil fields.

Oklahoma drilled 30 exploratory wells and opened five oil fields and three gas pools, in addition to ½ mile extensions to the Holdenville oil field and the Ravendale gas pool.

Michigan Strike

Michigan, out of 19 attempts, brought in the Hawkhead oil field, Allegan County, which appears to be a promising area. Kentucky met with no success in eight attempts, while Missouri's four trials brought no production.

Four wildcats were drilled in Florida and all proved to be dry, while Mississippi gained nothing out of five tests. North Carolina's only well this year, the Cape Hatteras wildcat, was abandoned after finding no shows.

Twenty-five producers were drilled in Texas out of 123 starts. These successful wells opened 8 oil fields, 2 distillate fields, and 2 gas pools, and located 8 new oil pays and 3 new gas strata. Also included were extensions made to an oil field and a gas field. At present the three new oil fields in Grayson and Young counties of North Texas appear to show the most promise.

New Oil and Gas Fields and New Pay Horizons Discovered in the United States in July, 1946

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure; [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
Lafayette	Spirit Lake	**ARKANSAS—New Oil Field** Austin E. Stewart-H. G. Lewis Jr.'s Hyrum Moore Est. 1, c nw se 14-16s-25w, 4 mi w Lewisville.	6-27-46	7-30-46	4513	4098–	Kilpatrick sd; L Cre	F 248; ½"	40	Flt; seis	Good oil shows in Tokio and Paluxy; seems likely to prove a major discovery; leading to revaluation of other fault line work.
Butte		**CALIFORNIA—New Gas Field** Standard of Calif.'s Donohoe fee 1, 6-20n-1e, Durham area. 3 mi sw of Chico gas fld.	.....	7– –46	6000	2140-2176	Meganos (?) sd; Eoc	F 10.9 mln	....	.....	.....
Rio Blanco	Rangely	**COLORADO—New Oil Pay** Continental's Dorothy Rooth 2, c sw sw 18-2n-103w.	.....	7– –46	6121	6080-6100	Shinarump cgl; Tri	F 840; ¼"	38	.....	.....
Clay	Hoosier	**ILLINOIS—New Oil Pays** K & B Drlg Co.'s Stanley 1, nw se se 11-4n-7e.	6– 8-46	7-30-46	3003	2842-2868	Aux Vases sd; U Miss	P 55; 125 wtr	....	.....	Third pay in pool. Previous pays shallower and deeper.
Clay	Ingraham, W.	Cities Service's Wyatt 5, ne nw sw 13-5n-7e.	5-22-46	7- 9-46	2946	2762-2772	Aux Vases sd; U Miss	P 150	....	.....	4th pay in pool. Previous prod from shallower and deeper sds.
Edwards	Cowling	G. H. Wickham's Schroeder 5, 430' s, 380' e ne ne 27-2s-14w.	6-18-46	7- 9-46	2239	2226-2236	Tar Springs sd; U Miss	P 50	....	.....	Previous prod from shallower and deeper pays. Mostly Waltersburg sd prod in that part of pl.
Hamilton	Thackeray	Ryford Oil Co.'s V. Johnson 3, (OWDD) sw nw se 10-5s-7e.	.....	7-23-46	3598	3459-3470	L O'Hara li; L Miss	P 19; 16 wtr	....	.....	Originally completed as a development well in an Aux Vases pl. One other well successfully deepened to new horizon.
Wayne	Keenville	Wiser's Keen 1, se se ne 28-1s-5e.	6– 3-46	7- 9-46	3129	3060-3068	L O'Hara li; L Miss	P 150; 75 wtr	....	.....	Pool produces mainly from McClosky li.
White	Trumbull	Pure Oil Co.'s W. T. Hall 1, ne ne nw 19-5s-9e.	7-10-46	7-30-46	3158	3150-3158	Aux Vases sd; U Miss	P 57; 13 wtr	....	.....	New deeper pay in a pool previously producing only from the Cypress sd.

New Oil and Gas Fields and New Pay Horizons Discovered in the United States in July, 1946

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
		ILLINOIS—Oil Field Extensions									
Clay	Sailor Springs Consol.	K & B Drlg Co.'s Patton 1, sw nw se 21-3n-7e, ¾ mi s ext.	5-12-46	7- 9-46	3080	2801-2810	Bethel sd; U Miss	P 8; 25 wtr			
Lawrence	Lawrence	Zanetis' American Nat'l Bank 1, nw ne sw 23-3n-11w, ¾ mi se ext.	4-28-46	7-23-46	1942	1886-1900	McClosky li; L Miss	P 18; 3 wtr			
Wabash	Friendsville,N.	S. H. Levitt et al's A. L. Gher 1, 474' s, 330' e, se se 1-1n-13w, ⅝ mi nw ext.	6-29-46	7-23-46	1621	1607-1618	Biehl sd; Penn	P 83			
Wayne	Clay City Consol	Nash Redwine's C. E. Downer 1, sw sw se 31-1n-8e, ½ mi ext.	6- 8-46	7- 9-46	3216	3122-3128	L O'Hara li; L Miss	P 115			
Wayne	Clay City Consol	Slagter's (Robinson & Puckett) Crisman 1, ne sw sw 32-1n-8e, ⅝ mi ext.	5-18-46	7-16-46	3153	3054-3068	Aux Vases sd; U Miss	P 277			
Wayne	Keenville	E. L. Markham's Keeler-Ellis 1, ne se sw 21-1s-5e, ¾ mi nw ext.	6-21-46	7-30-46	3126	3118-3124	McClosky li; L Miss	P 29; 9 wtr			
		INDIANA—Oil Field Extension									
Posey	Farmersville	Paul Rossi's Rippey 1, se se nw 30-6s-13w, 1 mi s ext.		7- -46	1453	1431-1453	Pottsville sd; Penn	P 51			
		KANSAS—New Oil Fields									
Barber	Boggs	Skelly Oil Co.'s Boggs 1, sw ne ne 17-33s-12w, 2 mi e of Medicine Lodge gas fld		7-27-46	4842	4824-4842	Simpson sd; Ord	F 47 1.4 mln	39	Ant; seis	May open trend extending e to big Medicine Lodge gas area.
Butler		J. P. Gaty's Schowalter 1, ne nw sw 23-28s-3e, 3 mi w of Augusta pl.		7-16-46	3003	3001-3003	Simpson sd; Ord	B 30		Possible str trp	Not considered important; porosity, permeability poor.
Stafford		Coralena Oil Co.'s Shank 1, sw nw nw 12-24s-13w, 2 mi ne of St. John's pl.		7- 5-46	3757	3738-3757	Viola li; Ord	P 473; 32 wtr		Possible str trp	Important strike; extent of productive area cannot now be determined due to type of accumulation; producing formation has good porosity, permeability.
		KANSAS—New Oil Pay									
Rooks	Stockton	Alkay Oil Co.'s Hindman 1, nw nw ne 35-7s-17w, 4½ mi se of Stockton.		7-24-46	2717	2675-2717	Topeka li; Penn	F 107		Ant; dr	
		KANSAS—Oil Field Extensions									
Russell	Gurney, W.	Bennett & Robert's Boxberger 1, ce/2 se ne 16-14s-14w, ½ mi n ext.		7-23-46	3061	3026-3029	Lansing li; Penn	P 75; 16 wtr		Ant; dr	Not considered important.
Stafford	Heyen	H. A. Hershfield's Hullman 2, nw nw sw 13-22s-12w, ½ mi n ext.		7-22-46	3675	3669-3675	Arbuckle li; Ord	P 18		Strp trp; dr	Not important.
		KANSAS—Gas Field Extension									
Barber	Deerhead	Champlin Ref. Co.'s Larkin 1, ewl sw ne 23-32s-15w, in the Deerhead area, ½ mi nw ext.		7- 3-46	4989	4958-4989	Maquoketa li; Ord	F 40 mln		Str trp; sub	
		NORTH LOUISIANA—New Distillate Field									
De Soto		Kerr McGee Oil Industries-Phillips' Nabor 1, c sw se 28-12n-14w, 2 mi s Mansfield.	5- 7-46	7-27-46	6684	6180-6200	Pettit li; L Cre	38; 2.3 mln; $\frac{64}{64}$"	58.5		
		SOUTH LOUISIANA—New Oil Field									
Beauregard	Bilbo	Magnolia's Powell Lbr. Co. 1, 1980 s 510 e of nwc 17-6s-11w, 2 mi nw N. Oretta disc.	4-30-46	6-21-46	8800	8412-	Cockfield sd; Eoc	F 85; $\frac{7}{64}$"	43.9	Flt; seis	Of little consequence.
		SOUTH LOUISIANA—New Oil Pays									
Iberville	White Castle	Shell's Wilbert 23, w fr nec 8-11s-12e.	5-19-46	6-20-46	7563	7310-	Miocene	F 195; $\frac{1}{8}$"	31.7	SD; seis	
Rapides	Big Island	Union Prod Co et al's Belgard 1, c ne nw 14-4n-3e.		7-23-46	12010	9684-9722	Tuscaloosa sd; U Cre	F 361; $\frac{24}{64}$"	46	Flt D; refl seis	Opens Tuscaloosa prod in Cent La. and will revive activity in this fld that was abt to be abnd. Of major importance.
St. James	La Pice	Shell's Mrs. Henry Schexnayder 4, w fr swc 38-12s-15e.	5-18-46	6-23-46	9962	9715-	Miocene	F 176; $\frac{1}{8}$"	33.1	D; refl seis	
Terrebonne	Dog Lake	Texas Co.'s State Lse 12-5 Dog Lake Unit 200, 2494 s 3059 w of nec sect 1 in unit 12, 1-22s-15e.	6- 2-46	7-21-46	10.31	9598-	Miocene	F 200; $\frac{1}{8}$"	37.3	SD; seis	
		SOUTH LOUISIANA—New Distillate Pays									
Acadia	Bayou Mallet	Union Sulphur Co.'s Willie Sattler 1, 50-7s-1e.	5-27-46	7- 4-46	8902	8465-8567	Vicksburg sd; Olig	32;2.5mln; $\frac{5}{32}$"	58.2	D; seis	Of little importance.
		SOUTH LOUISIANA—New Gas Field									
St. Landry	Shuteston, S.	Sun's Darby 1, 2029 s 414 e of nwc 6-8s-4e, 2 mi s of Shuteston prod.	1-31-46	7- 9-46	10130	9965-9985	Oligocene	no gge; $\frac{7}{64}$"			Not important.
		MICHIGAN—New Oil Field									
Allegan	Hawkhead	J. E. Hood's Taylor 1, ne sw se 20-1n-16w, 4 mi nw Casco pl.	6-12-46	7-20-46	1103	1101-1103	Traverse li; Devo	F 250	37.5	Coral reef; geol.	Promising area, but pools in general dist are small.
		OKLAHOMA—New Oil Fields									
Cotton	Cache Creek	R. B. Farris et al's Wook-kah-nah 1, sw nw sw 7-4s-11w, 5 mi sw of Temple townsite.		7- 1-46	1329	1316-1328	Pennsylvania sd; Penn	F 120	35.5	Flt Ant; sub	Opens shallow trend.
Cotton		C. H. Featherstone's Tunnell 1, nw nw nw 7-4s-10w, 4 mi sw of Temple townstie.		7-15-46	1319	1309-1319	Pennsylvania sd; Penn	P 200	36	Ant; sub	Opens a shallow trend sw of Walters pool.
Garfield		J. E. Crosbie, Inc.'s Seigle 1, ne se sw 32-23n-4w, abt 4 mi w of the old Garber area.		7-27-46	6063	6058-6063	Second Wilcox sd; Ord	Sw 64		Ant; sub	Not considered important.
Pottawatomie		T. N. Berry's Johnson 1, nw nw sw 27-6n-3e, 1 mi e of Washer pl.		7-29-46	1855	1840-1855	Hoover sd; Penn	P 34; 47 wtr		Ant; dr	Not considered important.
Seminole		Mealy-Wolfe Drlg Co.'s Coesee 1, nw ne ne 27-9n-5e, abt 1 mi s of Earlsboro pl.		7-30-46	4332	3480-3550	Earlsboro sd; Penn	P 100	39	Ant; seis-sub	
		OKLAHOMA—Oil Field Extension									
Hughes	Holdenville	I. V. Horner et al's Williams 1, sw nw nw 6-7n-9e, ½ mi e ext.		7-17-46	2802	2772-2802	Booch sd; Penn	F 150; 5 mln		Ant; dr	Revives old Holdenville area.
		OKLAHOMA—New Gas Fields									
Lincoln		The Texas Co.'s Yeldell 1, se nw nw 11-14n-6e, 1½ mi w of Stroud pl.		7- 8-46	4060	4042-4060	Hunton li; Sil-Devo	F 10 mln		Possible str trp; seis-dr	
Okfuskee		Loftis Drlg Co.'s Kennedy 1, ne ne ne 14-12n-9e, betw the Castle and Morse pls.		7-15-46	3710	3709-3710	Hunton li; Sil	F 7 mln		Str trp; dr	
Pontotoc		The Texas Co.'s Gray 1, ne se sw 18-4n-5e, abt 3 mi s of Bebee pl.		7-26-46	3248	915- 981	Pennsylvania sd; Penn	F .65 mln		Ant; seis	Unimportant.
		OKLAHOMA—Gas Field Extension									
Lincoln	Ravendale	Roy L. Kemp's Tyner 1, se se se 28-17n-6e, 2 mi se of Avery pl, ½ mi n ext.		7- 7-46	3052	3020-3052	Red Fork sd; Penn	F 2.2 mln		Ant; dr	Proves approximately 200 additional acres.

		NORTH TEXAS—New Oil Fields										
Grayson	Handy	The Texas Co.'s J. R. Handy 2, 2278′ snl and 875′ ewl of south 508½ acs of 1063-ac tr. Samuel Stewart Sur., A-1069, ¼ mi nw of 3339′ failure.	6-17-46	7-20-46	1699	1665-1698	Strawn sd; Penn	F 509; ½″	39.6	Flt ant; geol-cd	Discovery was by 7th "slim-hole" test by co. Dry holes localize productive area, although disc has about 30 ft of effective pay.
Jack	.....	Hanlon & Buchanan Inc.'s J. Moore 1-B, 330′ snl and 1320′ ewl of ne¼ BBB&C Ry Sec 2, A-1376, near shallow pl.	8-15-45	7-21-46	6008	5890-6008	Ellenburger dolo; Ord	P 15; 7 wtr	41	Ant; geol	Production not profitable at this level.
Young	.....	Robert C. Davis et al's Baldwin-Lovett 1, 750′ snl and 1083′ ewl TE&L Co Sec 207, 2 mi se nearest deep prod.	6-11-46	7-13-46	4865	4844-4859	Mississippi li; Miss	F 476; $\frac{5}{32}$″	44	Ant; geol	Logged 19 ft of effective pay; lge natural potential and working pressures for this zn. Productive area small.
Young	.....	A. R. Dillard et al's M. Killian 1, 330′ snl and 1650′ wel Sec 211, TE&L Co Sur, 1⅞ mi e by s of Crain fld, nearest deep area.	6- 1-46	7-21-46	4965	4944-4960	Mississippi li; Miss	F 280; 1″	44	Ant; geol	Pay thickness better than av for Mississippian; small producing area with apex to east.
		NORTH TEXAS—New Oil Pays										
Archer	Burns-Benson	H. W. Snowden O&G Co.'s J. E. Morrison 2, 967′ ewl and 1700′ snl TE&L Co. Sec. 1823, 933′ w of 4500-ft Bend producer.	5-10-46	7-13-46	4340	4316-4340	Strawn sd; Penn	P 218	42.8	Ant; geol	Shallowest of field's 3 deep pays; Strawn pay probably confined to high point of struct.
Young	Garvey	R. S. LeSage et al's C. K. Garvey 2, 330′ nsl and 750′ wel of sw¼ sec 1, A. B. Jamison Sur A-1686, W/O to 4300-ft Bend prod.	6- 5-46	7- 7-46	3648	3630-3648	Strawn sd; Penn	P 12	40	Ant; geol	Not important.
		WEST CENTRAL TEXAS—New Oil Pays										
Hamilton	Pottsville	Homer W. Snowden O & G Co.'s Emil Stegemueller 1, 660 ft from se and sw lines of 149.6-ac lse, L. W. Dickerson Sur No. 25, nw edge of gas fld. OWDD from 3065 ft & PB.	.....	6-24-46	3460	2920-3120	Bend li; Penn	F 5; .5 mln	....	Ant; geol	Not important. 1st oil prod in county that has 1 gas area.
Shackelford	Hubbard Creek	Phillips Pet. Co.-Pan Oil Co.'s Hickman-Nellen 1, 660′ snl and 606′ wel Sec 16, Lunatic Asylum Lands, ne offset to Ellenburger disc.	4- 6-46	7- 6-46	4310	3934-3948	Marble Falls sd; Penn	P 29; 2 wtr	42.3	Ant; geol	Failed in Ellenburger; being 19 ft low. New pay doesn't warrant further development.
Taylor	Murphree	West Central Dr. Co.-McElreath-Suggett & W. W. Harvey et al's C. H. Murphree 2, 1120′ wel and 990′ nsl S. P. Ry. 1, blk 9, 1005 ft nw of 2600-ft Cook li disc.	6-28-46	7-18-46	2888	2706-2710	Upper Hope li; Penn	F 306; ¼″	41	Ant; geol	Pay will be erratic, involving small area.
		WEST TEXAS—New Oil Pay										
Ector	TXL-Clear Fork	Phillips Pet. Co.'s T. P. Land Trust 1-E-a, 616′ snl and 717′ ewl T&P Ry 39, blk 45, T-1-S, 1 mi e of s end of TXL-Devonian fld, nearest.	9- 5-45	7- 9-46	11506	5615-5630	Clear Fork li; Penn	F 139; ¼″	36.5	Flt ant; geol	Situated on downthrow of steep flt; TXL fld's deep pays barren. Producing from top of Clear Fork and similar to the Crossett and Robertson flds. Extent of prod area speculative.
		WEST TEXAS—New Gas Field										
Pecos	West Owego	Bryce McCnadless et al's Atlantic-Cordova-Gulf 1-115, se ne se H&GN Ry. 115, blk 11, 1½ mi w by n of 2970-ft gasser, nearest; OWDD from 1643 ft.	10-25-44	7-18-46	2260	2250-2260	Clear Fork li; Perm	4.5 mln; 2″	....	Ant; geol	Market is available for this gas. Not important, as nearby failures in Ellenburger.
		UPPER TEXAS COAST—New Oil Fields										
Matagorda	.....	Amerada et al's Ike Laughlin 1, 660 fr wl 330 fr n&sl 39.54-ac lse, and lot 5, John Holmes sur, 3 mi se Blessing.	2-10-46	7-26-46	11513	8832-8846	Frio sd; Olig	F 132; $\frac{3}{4}$″	47.2	Flt; seis	Some additional drilling seen.
Wharton	Hutchins	Lake View Oil Co.'s J.E.J.Johnston 1, 396 fr nel,731 fr sel 150.66-ac lse,I&GN sur 15&22, 1 mi se Lake View gas fld.	6-20-46	7-15-46	5789	4515-4526	Oligocene	F 126; ⅛″	24.3	Flt	Thin sand section. Considered of minor importance at present.
		LOWER TEXAS COAST—New Oil Pay										
Hidalgo	Los Indios	Baldridge & King's W. L. Goldston et al 4, 7747 fr el, 1847 fr wl, 5757 fr sl 7358-ac lse, 4640 w of Goldston 2, 2000 w of Goldston 3, dry hole.	4-25-46	7- 1-46	7207	.....	.....	No gge	....	Flt	Not important.
		LOWER TEXAS COAST—New Distillate Field										
Jim Wells	.....	Haynes B. Ownby Drlg Co.'s Vicenta Gonzales 1, 1320 fr el 660 fr sl 125-ac lse, se¼ 500-ac tr, nwc La Tinaja de Lara Gr, 1½ mi s se Armagosa gas fld.	4-25-46	7- 1-46	6800	6783-6800	.....	No gge; 90% wtr; $\frac{3}{8}$″	....	.....	Field shut in with no gauge taken.
San Patricio	Beasley	Southern Minerals Corp.'s John R. & Floy L. Beasley 1, 990 fr sel 3200 fr nel 1004-ac lse, 4900 fr nwl 335 fr nel V. Joarez sur, 1 mi nw Clifton 1, dry hole.	6- 6-46	7- 7-46	4999	4900-4908	.....	F 10; $\frac{3}{64}$″	....	.....	No additional development seen.
		LOWER TEXAS COAST—New Gas Pay										
Bee	Tynan	Producers Corp. of Nev.'s W. A. Karsch et al 2, 467 fr ne&nwl nwly port 192.5-ac tr, H. H. Williams sur out of 400-ac lse, 2020 se Karsch 1.	6- 1-46	7-10-46	4741	4682-	Stillwell sd; Olig	F 1.5 mln; $\frac{3}{16}$″	....	.....	Not important.
		LOWER TEXAS COAST—Gas Field Extension										
Jackson	Texana	Donald W. Moore-T. J. Ahern's E. A. Clement et al's 1, 1320 fr nl 330 fr el 79.4-ac lse, w½ lot 17, Clement sbdn, S. F. Austin 2-Lge Gr. 3/5 mi e ext.	6- 6-46	7- 1-46	6823	5595-5605	Frio sd; Olig	F 6.2 mln; $\frac{3}{8}$″	....	.....	Not important.
		SOUTHWEST TEXAS—New Oil Field										
Starr	.....	W. D. Kennard's M. M. Garcia 1, 330 fr el 430 fr sl blk 29, tr 215, sh 12, porc 90, 4200 w nw n Boyle prod, 5600 s of Roncon sw ext prod.	.....	7-22-46	3541	3494-	.....	F 102; ⅛″	41.5	Flt	May link Boyle & Rincon flds. Will probably lead to additional development in field.
		SOUTHWEST TEXAS—New Oil Pay										
Starr	Cortez	W. H. Holland's Roos-Bennett 2, 330 fr sl 1068 fr el 120-ac lse, sh 100, Porc 93, 933 sw Roos-Bennett 1, disc well.	.....	6-21-46	3006	2910-	.....	F 66; ¼″	22.8	.....	.....
		SOUTHWEST TEXAS—Oil Field Extension										
Starr	Rincon	Continental's Mrs. Bess Semmes 1, 330 fr el 1650 fr sl sur 906, on 640-ac lse, 7000 n ne Frio prod 3/5 mi nw ext.	6-18-46	7- 7-46	4710	4520-4531	Frio sd; Olig	F 6	....	Ant	Small production; little importance.
		SOUTHWEST TEXAS—New Gas Field										
Duval	.....	Edwin B. Cox-Jake L. Hamon's Leila Peters 1, 330 fr nl 1282 fr wl BS&F sur 194, on 1199-ac lse, 14 mi sw Freer.	7- 3-46	7-20-46	2700	2612-2618	.....	F 8.5 mln	....	.....	Of little importance.
		SOUTHWEST TEXAS—New Gas Pay										
Duval	Strake	Santa Clara Oil Co.-Maguire Industries' J. O. Yates 2-A, 330 fr sl 1333½ fr el Jessie Harris sur 5, on a 60-ac of "A" lse, n of prod.	4-17-46	7- 1-46	3795	.....	.....	F 10 mln	....	.....	No additional development seen.
		SOUTH CENTRAL TEXAS—New Oil Field										
Guadalupe	.....	United North & South Dev Co.'s J. F. Webb 1, 1270 fr nely/nel 330 fr sely/nwl 151.8-ac lse, Jas. Hodges sur, 2 mi sw Day fld.	5- 7-46	6-28-46	2525	2421-2453 2485-2505	Serpentine ser; U. Cre Austin ch; U Cre	P 175; 50% wtr	....	.....	Minor importance.
		SOUTH CENTRAL TEXAS—New Gas Pay										
Frio	Pearsall	Highland Oil Co.'s Halff & Oppenheimer 12, 1242-ac lse J. H. Gibson sur 15, 874 n of well 3, 874 s of well 10.	6-12-46	7- 3-46	4335	4273-4279	Navarro sd; U Cre	36 cond; 36 mln	....	.....	Not important.
		WYOMING—Oil Field Extension										
Converse	Big Muddy	Dyer & Rice's Barber 1, nw se 3-33n-76w, 1 mi e ext	.....	7- -46	4459	4383-4398	Lwr Dakota sd; U Cre	B 50	....	.....	.....

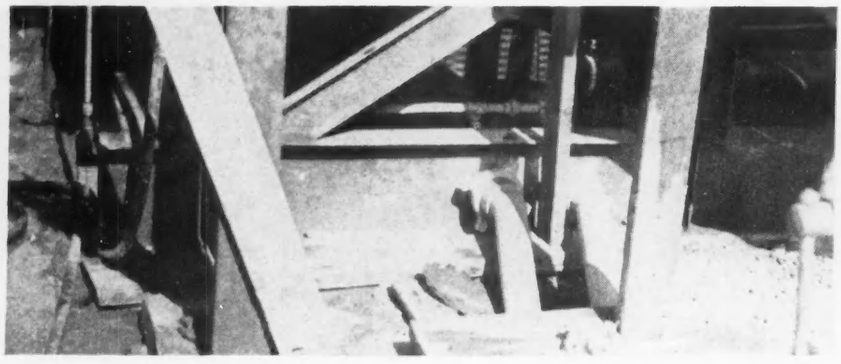
[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale; ser, serpentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleistocene; Plic, Pliocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.

[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches.

[3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace.

[4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology; tb, torsion balance.

Steam Lines Installed In Skid Bases



In order to speed rigging-up work on drilling engines and similar steam-engine equipment, one company has unitized the steam line connections in the sectional steel bases which accompany such equipment. In the installation shown, twin steam lines, coming up to the rig from the boiler setting, are connected with quick-attaching unions to permanent lines mounted in the base structure. These short lines are run through the large I-beam base and attached so that no time will be lost in making up the fittings. No pipe fitting, welding, or time-losing aligning are required with these built-in fittings. Such incorporation of steam lines within the unitized skids has not only facilitated setting-up the rig, but has reduced replacement of connecting pipe due to losses and rough treatment during rig moves.

STEAM LINES

In addition to reducing the number of pieces of pipe connections that must be moved, the recessed location of the male threaded section within the "H" beam gives added protection to the pipe ends. When made up, the joint is equally protected from heavy equipment such as trucks and tractors.

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WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

See Pages 2450 to 2455, Composite Catalog.

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Baffle and Gasket Improve Mud Shield

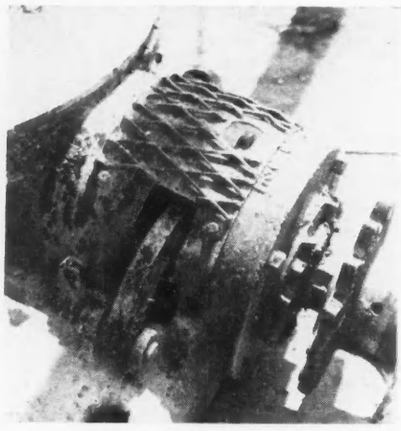
In order to more completely reduce mud or oil splatter when using the split guard on breaking out of drill pipe joints, one operator employs a light baffle and strips of sheet rubber or rubberized fabric along the edges of the hinge line to prevent escape of fluid which usually sprays out with considerable velocity. The gasketing is bolted beside the baffle or light flange and is secured to the edges of the guard in such a way that a seal is effected when the doors are closed, and eliminates much spilling of mud fluid over the table and rig flooring where the men are working.

MUD CONTROL

To prevent escape of fluid over the top of the guard, a split disc of heavy belting is easily secured to the inside of the upper end of the guard. Having a hole cut in it equal to the outside diameter of the drill pipe, the disc halves close snugly about the pipe, confining fluid to the inside of the guard.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

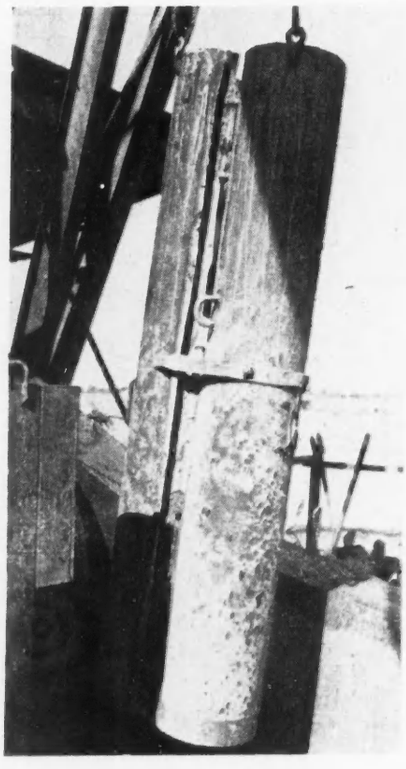
Non-Slip Surface



Elimination of any possibility of a man slipping and falling on the rig floor is one of the goals of an alert safety engineer. The prevention of one disastrous fall may go far toward paying for, or making worthwhile, all safety installations on the rig. To remove the possibility of a man slipping while he is stepping over equipment, one company makes it a practice of tack-welding small patches of expanded metal similar to that shown, where such material was applied over the upper surface of the rotary table pinion housing.

SAFETY PRACTICES

The material and labor connected with such a practice is negligible compared with the beneficial results obtained.

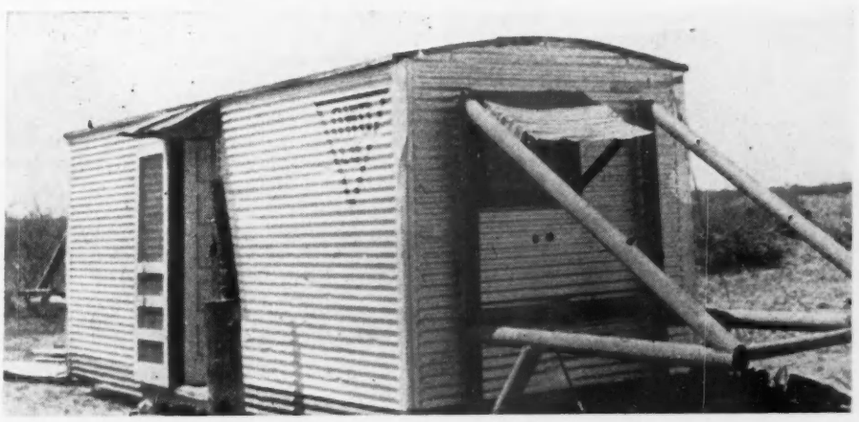


Supports Speed Pipe Rack Setup

PIPE STORAGE

For fast set up of drill pipe and casing racks, one operator fabricated the portable rack supports as shown. These type supports are easily set up at any convenient position around the rig and any number may be used to satisfy the needs of the user. Such an arrangement eliminates the necessity of rebuilding the wooden pipe racks normally found around drilling rigs. These racks not only reduce the time required in setting up, but also save much heavy stock wooden members used in pipe racks. Relatively light in weight, they may be positioned by one or two men and are adaptable to uneven ground. Made of 2½-inch and four-inch scrap pipe, these rack supports are welded and form a rigid platform to store pipe and other drilling equipment. The uprights are of four-inch stock, while the bracing members are of 2½-inch stock. The footing piece is a split section of scrap casing, as is the top cradle piece. These pieces can be made to any height and any size to suit any rig setup. The long horizontal pipe held in position by the upright supports may be of any available size strong enough to withstand the loads imposed on the racks. This may be a discarded piece of 4½-inch drill pipe or short piece of 5-inch casing. Such rack supports are also useful around pipe yards for temporary storage, and may be transported to other locations for reuse.

Doghouse Cradle Facilitates Moving



EQUIPMENT CARE

Transporting the doghouse, change room or tool house from one location to another may be facilitated by the application of a tubular cradle as shown. To save valuable time and expense, one drilling contractor constructed a cradle or bed to afford a means of lifting and moving the doghouse. Constructed of discarded 4½-inch drill pipe, the cradle is simple to fabricate and does not involve excessive expense since it is all-welded and does not require additional material except the salvaged pipe and welded rods. Two longitudinal supports span the entire length, and when the doghouse or tool room is being moved, these members carry the load. Spacers are welded at intervals on the bottom to add strength. At each end of the doghouse, two uprights are welded to these longitudinal supports. The height of each depends on the height of the structure being moved. Two horizontal arms are fixed to these uprights at both ends and braced in the manner shown.

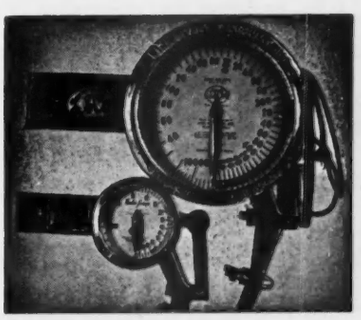
With the suspension completed as described, one end of the cradle may be drawn up onto the bed of a truck by means of the truck's winch, while the other end is secured to the rear wheel section of a bedless trailer. Thus, the cradle actually becomes the bed of the trailer when en route to another location.

. . . but not when you are cementing casing in a well

That's one time to take every possible precaution, and the simplest, surest, low-cost method you can follow is to use Baker Casing Centralizers on the shoe joint, and on a joint or two above. The casing is centered in the hole so that cement slurry can get all around it, and you know the odds are with you to get a sound "first-time" cement job. Call any Baker man and he will see that you are supplied promptly with . . .

BAKER CASING CENTRALIZERS

LINE SCALES



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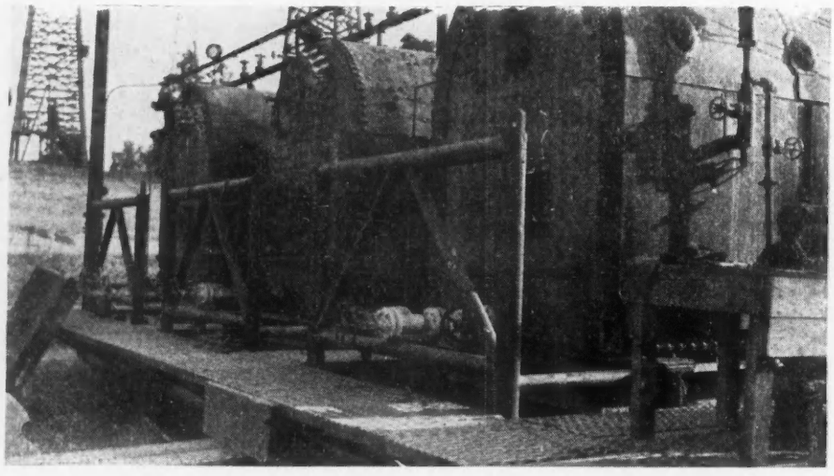
SUPER AUTOMATIC
The Latest
IMPROVED MODEL
DESIGNED AND BUILT TO WITHSTAND THE SEVERE SERVICE IMPOSED BY MODERN DEEP WELL DRILLING.
SAFE
WILL NOT ACCIDENTALLY ENGAGE—POSITIVELY CANNOT REPEAT
DEPENDABLE
RUGGED CONSTRUCTION—LONG TROUBLE-FREE SERVICE
ECONOMICAL
LONGER SERVICE • LESS MAINTENANCE COST
This Unit is designed and built to satisfy completely the demands of the Drilling Industry. No destructive shocks and impacts—long, predetermined stroke, (42-in.). Fast, fully automatic action. Interchangeable with all other GEMCO models.
OPTIONAL CONTROLS
Mechanical, hydraulic, pneumatic or steam
Need not be disturbed when removing or replacing Cathead Unit—a time-saving achievement common to all GEMCO models.
OTHER MODELS
SPINNING
FRICTION BREAKOUT
PLAIN BREAKOUT
ALL MODELS FEATURE—
★ Standardization
★ Interchangeability
See Your Drawworks Manufacturer, Supply Store or Write us Direct.
Dept. JW
GEMCO OIL TOOLS, INC.
4417 OLEATHA AVE., ST. LOUIS 16, MO.

Lifting Arms Facilitate Boiler Moves

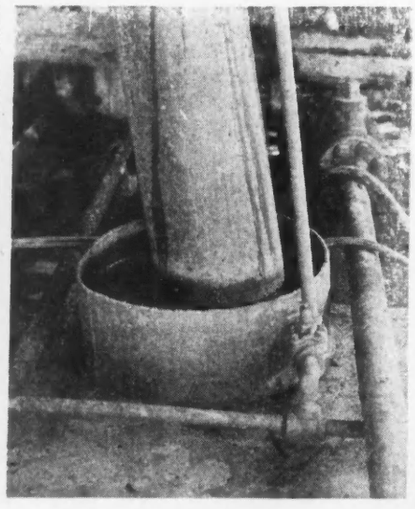


BOILER CARE

By elevating the lifting eyes on their boiler units, one company has achieved time and equipment-saving results. Upright lengths of drill pipe were attached to the skid bases and the arms strengthened as shown with horizontal and diagonal members securely braced. Horizontal arms running the length of each unit also were placed along each side just underneath the sills.

In addition to saving time in being able to more quickly hook on to the ears provided at the top of each of the corner posts, the fact that the slings are held some distance away from the boiler shell helps to eliminate a cause of injury to gauges, valves and light piping, as well as insulation sheeting, when the heavy unit is swung into the air.

Rat Hole Spudding



RIGGING UP

Prior to pouring the cement flooring on a new drilling site, one company makes it a practice of positioning a short length of conductor pipe in the ground at the point where the rat hole later will be drilled. Projecting above the finished concrete some ten to 12 inches, the large diameter enclosure provides a convenient means of confining the mud and water when the rat hole is being spudded, and thereby reduces non-productive time spent prior to spudding in the well. Use of a large diameter conductor also permits the shift of the final position of the rat hole to suit local conditions existing on the newly-installed rig floor.

Upon completion of the well, that part of the conductor remaining above the floor can be removed with a cutting torch.

Sterling
PUMPS • HOISTS • LIGHT PLANTS
DEPENDABLE
RUGGED
SIMPLE
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SAVE MONEY
SAVE TIME
STERLING QUALITY
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STERLING
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Tax Review

A Regular Feature of THE OIL WEEKLY

By WILLIAM O. TAYLOR*

Corporations Producing Oil Held Entitled to Relief from Excess Profits Tax

The first court case involving the claim of a corporation engaged in oil production for relief under one of the special provisions of the excess profits tax law has been decided in favor of the taxpayer, Southwestern Oil & Gas Company. The corporation claimed the benefit of Section 721 of the code which provides relief under some circumstances where a taxpayer received abnormal income in any year during the excess profits tax period. The statute provides that income shall be divided into classes and that in any year, the income in any one class is abnormal if it is abnormal for the taxpayer to receive that kind of income *or* if, in that year, the amount of that kind of income is more than 125 percent of the average amount of the same kind of income for certain prior years. If a corporation received abnormal income, it is provided that part of it may, in certain cases, be attributed to other years for the sole purpose of computing the excess profits tax.

One class of income set up for determining the applicability of Section 721 is "income resulting from exploration, discovery, prospecting, research or development of tangible property, patents, formulae, or processes, or any combination of the foregoing, extending over a period of more than twelve months . . ." The government's regulations provide that this provision includes the development of oil leases.

The taxpayer, Southwestern Oil & Gas Company, was the owner of several leases in Illinois which had apparently been producing for many years. In 1938, greatly increased production was obtained by drilling to a deeper sand and further drilling in 1939 and 1940 resulted in the corporation's income in 1940 (the first excess profits tax year) being very much greater than its income in the four prior years. It claimed that part of the income should be allocated to the year 1939 (prior to the excess profits tax) due to the fact that a great part of the development expenditures which resulted in increased income were made in that year, which claim was sustained by the court.

The government's regulations provide, with respect to income of the class involved in this case, that it "is to be attributed to the taxable years during which expenditures were made for . . . exploration, discovery, prospecting, etc.," although they provide elsewhere that no income is to be attributed to a previous year "solely by reason of an investment by the taxpayer in assets, tangible or intangible, employed in or contributing to the production of such income." In an earlier case, *W. B. Davis & Sons, Inc.* 5 T. C. No. 145, the Tax Court had noted the seeming inconsistency of the two provisions and held that the first is applicable where the type of income involved is that included within the class which also includes oil income due to lease development.

Under the provisions of Section 732 of the Code, it appears that the Tax Court's decision in the *Southwestern Oil & Gas Company* case cannot be appealed. Corporate taxpayers whose income was substantially increased by new development during or immediately prior to the excess profits tax period should review their position for the years during such period to see whether they would be aided by re-allocating income to the periods when such development occurred. Possible benefits are not limited to instances where, as in the *Southwestern* case, part of the income is re-allocated to a year prior to the time the excess profits tax went into effect.

While there seems to be some doubt whether relief under Section 721 is available by a claim for refund, taxpayers who believe they are entitled to relief under that section should file such claims as to each year for which such claim would be timely. In most cases, this would include 1943 and subsequent years.

Time May Be Advantageous for Incorporating

The year 1946 has thus far not dealt too kindly with many drilling contractors and other service organizations within the oil industry. Doubtless, many of them have incurred losses so far, although price increase and some loosening of the pipe situation make the future outlook considerably better. If such organizations are operating as partnerships or sole owners rather than as corporations and, in the lusher years of 1944 and 1945, had high-bracket income, they should consider the desirability of incorporating before better times turn this year's loss into a profit. The owner or owners of such a business will report on their personal returns the loss incurred prior to incorporation and may well be entitled to carry such loss back to a prior year and recover some of the taxes paid in that year. The corporation will, of course, report any profit made after it comes into existence.

Repeal of the excess profits tax law at the end of 1945 has already furnished an incentive to return to the corporate form of doing business. However, such a step should not be taken without full consideration of the consequences. What seems to be a more advantageous tax position may, over the long pull, prove otherwise. One disadvantage is that sooner or later, if the corporation prospers, the question of unreasonable accumulation of profits with its resulting tax penalty will probably be raised and may be avoided only by paying sufficiently large dividends to nullify any advantage due to differences between the tax rates of corporations and individuals, since part of the profits would be taxed twice. Another is the fact that, while changing from a proprietorship to a corporation can usually be accomplished painlessly insofar as taxes are concerned, a change in the opposite direction can be excruciating and is rarely easy.

Other than tax consequences, the advantages lie almost wholly with the corporate form of carrying on business.

☆ ☆ ☆

Program to Equalize Gas Withdrawals Is Advocated

New plans for prorating gas in the Carthage field, Panola County, Texas, were advocated by operators, pipe line companies and royalty owners at a recent hearing before the Texas Railroad Commission. Purpose of the program was to equalize withdrawals from the entire field and give every purchaser a chance to take gas when he needed it.

Gas is now allocated on acreage times pressure, but some wells are connected to pipe lines serving domestic markets while others are tied to gasoline plants. This results in an unequal load, which varies as much as 90 percent for some of the pipe lines.

Lone Star Gas Company's program would equalize these takes, so that, on an annual basis, all wells would be in balance. Allocations would be made to the various wells in the field on the old basis. However, the change would be made in the time the gas is produced.

If the line fails to take the full allowable for the month, then this would be accumulated as a credit to the well until the demand existed, when it would be produced. Production in excess of the allowable for a well would be permitted, provided the excess did not exceed six times the monthly allowable for the well. Should overproduction exceed six times the monthly allowable, then the well must be shut in until the overproduction drops below this maximum. Once each year each well must be brought into balance, must be underproduced for one month.

Advocates of the program insisted that it would solve many producing and purchasing problems, and skeptics went along with the plan in the hope that it would work out favorably.

Court Upholds Claim for Only One Set of Books

Only one set of official corporate accounts need be kept by a company, the Court of Appeals for the District of Columbia ruled recently as it reversed the U. S. District Court decision in Arkansas Power & Light Company's suit against the FPC and the Arkansas Commission. Both bodies had sought records but on somewhat different basis.

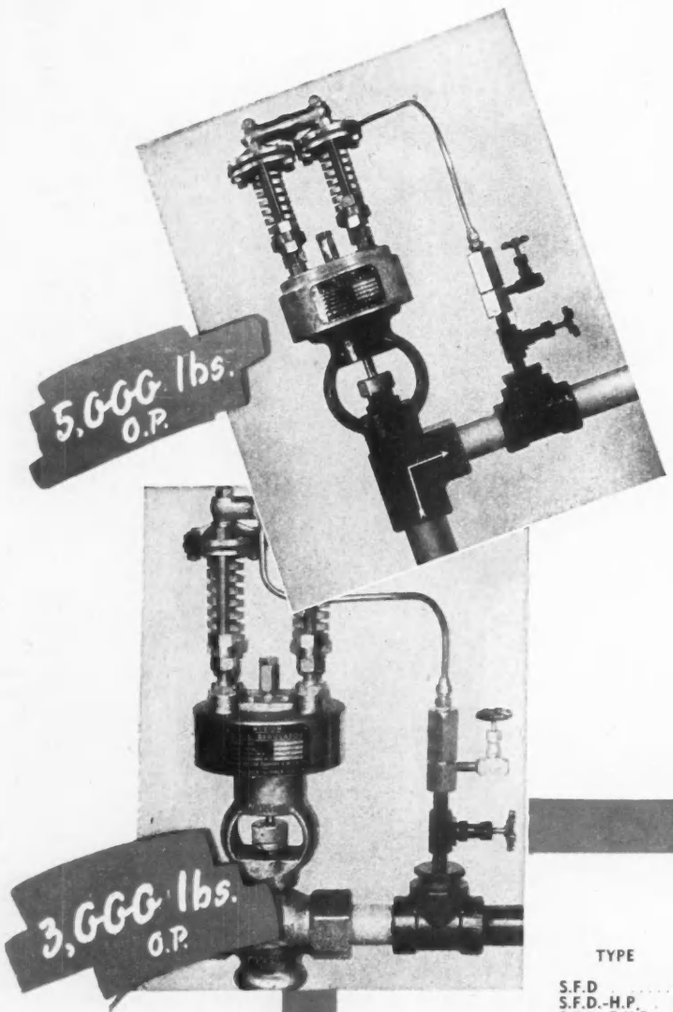
The appeals Court also held that "in such circumstances a utility should be able to learn from a declaratory judgment which commission has exclusive jurisdiction," thereby overruling the FPC contention that it must always have made a final order before any person aggrieved may obtain a judicial review of its action.

* The author is a member of the firm of Butler, Binion, Rice & Cook, Houston.

NOW... a Nixon Regulator that will handle

5,000 lbs. OPERATING PRESSURE

10,000 lbs. test pressure



Yes—here is a Selective Flow Differential Regulator that not only handles 5000 lbs. operating pressure safely—but reduces it to 1000 lbs. or less—in a "single stage" operation.

Is there another make Regulator on the market that can do this?

And the Nixon Regulator has a "snap action" Valve that reduces to a minimum cutting action of the gas on main valve and seat.

Once Set — it requires no further attention.

Remember—you need only one Nixon Regulator to solve your pressure reduction problems.

OPERATING DATA

TYPE	Test Pressure	Maximum Operating Inlet Pressure	Controlled Discharge Pressure Max.	Min.
S.F.D	6000 lbs.	3000 lbs.	650 lbs.	100 lbs.
S.F.D.-H.P.	6000 lbs.	3000 lbs.	1000 lbs.	100 lbs.
S.F.D.-E.H.P.	10,000 lbs.	5000 lbs.	1000 lbs.	100 lbs.

Sold and Serviced Exclusively by

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1412 MAURY ST., HOUSTON, TEXAS

SALES OFFICES: Tulsa, Oklahoma; Dallas and San Antonio, Texas. LOS ANGELES: Western Pressure Control, 5700 Santa Fe Avenue. TRINIDAD, B.W.I.: Neal Massey Eng. Corp.

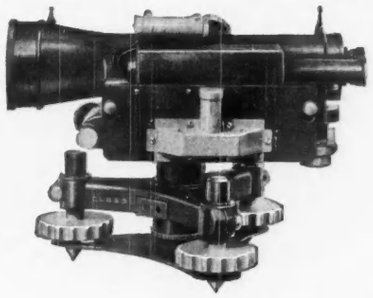
BRANCH STORES: TEXAS—Kilgore, Beaumont, Barbers Hill, Bay City, Monahans, Alice, Victoria, Corpus Christi, Columbus. LOUISIANA—Lake Charles, New Iberia, Harvey, Shreveport. ARKANSAS—Magnolia. MISSISSIPPI—Natchez.

NEW EQUIPMENT LITERATURE

For additional information, use mailing card inserted opposite this page

1—Dumpy Level

C. L. Berger & Sons, Inc., have designed and developed the new Berger engineers' tilting dumpy level, a precision instrument for obtaining levels at great speed. It is equipped with a tilting screw



having a differential motion, drum and single index, prisms and mirrors, electric illumination for telescope and spirit level vials. With the interior focusing system, the object glass is fixed in position.

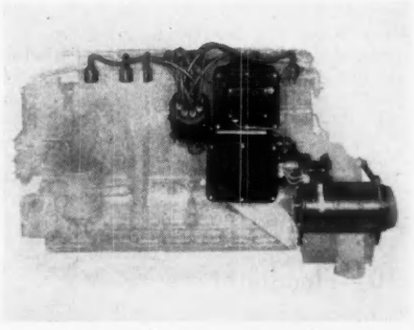
Focusing is accomplished by moving an interior lens, usually a "negative lens" placed between the objective and the ruled glass diaphragm. In this manner, the ends of the telescope can be sealed tightly. The "constant of the instrument" using the interior focusing system is so small that it may always be omitted. The telescope may be separated from the center bar which supports it by removing the shaft on which it fulcrums.

The level is furnished with a mahogany carrying case which also houses the cleaning brushes, spare level vial, and associated equipment. The weather-proof battery case is mounted in one of the tripod legs for protection and ease of handling.

(Check item 1 on postcard for more information.)

2—Ignition System

A filtered ignition system designed to prevent dangerous explosions due to sparks and other ignition leakages or defects has been introduced by the Hallett Manufacturing Company. It is



said to be an effective safeguard against fires and explosions in internal combustion engines caused by sparks, high-frequency leakage emanation from distributors, spark plugs, coils, wires, generator terminals and voltage regulators on internal combustion engines used in oil field drilling and pumping operations.

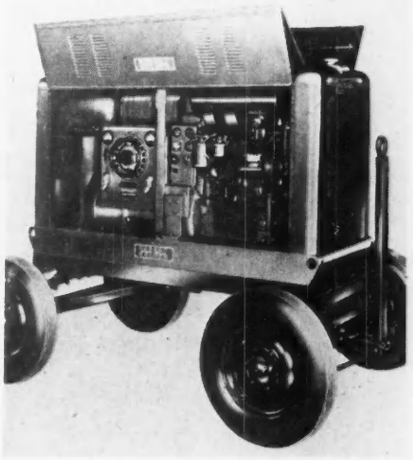
The entire electrical system is completely enclosed, forming a moisture-proof shield that eliminates electrical hazards as well. These shielding installations are available in packaged kits ready for use on most standard types of stationary and marine engines.

(Check item 2 on postcard for more information.)

3—Arc Welder

Newest addition to the Hobart Brothers Company's "Multi-Range" welder line is a diesel engine-driven arc welder of 300-ampere capacity especially made for use in locations where electric power is not available. It is powered by a two-cylinder, unit-injection diesel engine that features oil cooling, displacement blower, fuel filtration, and has a 4½-inch bore, a five-inch stroke and is rated at 47 horsepower at 1450 revolutions per minute.

Equipped with patented "Multi-Range" dual control and remote control, this welder permits the operator to make fine volt-ampere adjustments right at work. The welding generator has a



rating of 300 amperes at 40 volts. Current range of welding duty is from 20 to 40 volts, 60 to 375 amperes. It is a single-operated variable-voltage type, with four laminated main poles and four interpoles (commutating poles). Pole pieces are removable. This unit also has an oversize, four-pole exciter built in on main shaft that insures quick arc recovery and buildup, and eliminates accidental polarity reversal.

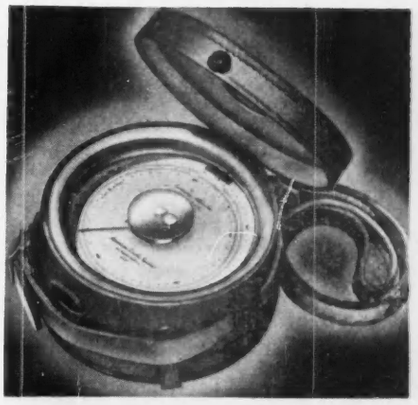
The entire unit is enclosed in a steel canopy with hinged side panels and door latch that allows the panels to snap closed. Means for padlocking the panels also are provided.

(Check item 3 on postcard for more information.)

4—Altimeters

The American Paulin System has introduced series "SA" surveying altimeters to cover all ranges above and below sea level. Their accuracy (laboratory tests have shown these instruments to respond to elevation changes in inches, a sensitivity of better than one part in 12,000) makes them particularly suited for geological exploration in foreign and U. S. mountainous regions.

Diaphragm movement is directly and



without friction read in terms of inches pressure or in feet altitude on the dial. The instrument operates on the nul or zero-gauging system. It is said to be so completely compensated for instrument temperature error that no correction is necessary. It indicates altitude immediately without lag and it is never necessary to tap the glass or vibrate the instrument in taking readings.

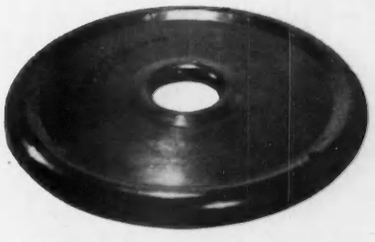
The indicators are of knife-edge and needle-point design with mirrors to eliminate parallax and give accurate readings. Diameter of the dial is 4¾ inches; weight of the instrument with leather carrying case is two pounds.

These instruments have proved themselves ideal for all preliminary survey work, according to the manufacturer, and will stand up under rugged field service. Each instrument is provided with a leather case that has a hand and shoulder straps and will withstand the jolts, jars and vibrations in all conceivable field uses without affecting the sensitivity or accuracy.

(Check item 4 on postcard for more information.)

5—Pipe Wiper

Duraflex Company is manufacturing a special-formula rubber pipe wiper for the oil industry and incorporates new elements of design. The special-formula rubber was developed for toughness and



flexibility, and is similar to certain rubbers used in the aircraft industry to meet wartime requirements. It is said to be

highly resistant to abrasion, oil, gas, heat, cold and drilling mud chemicals. The wiping face of the rubber pipe wiper is increased to add strength and efficiency. The wiper is reinforced by a solid metal ring made of heat-treated alloy steel molded into the circumference of the ring. This ring is of sufficient size to be easily gripped for installation.

(Check item 5 on postcard for more information.)

6—Hydraulic Jacks

Designed for all-purpose application in the oil fields is the new line of Hi-Power hydraulic jacks recently announced by Duff-Norton Manufacturing Company. The jacks are made in 3, 5, 8,

12, 20, 25, 30 and 50-ton capacities. Hydraulic oil is sealed in tanks isolated from the jack exteriors to permit both vertical and horizontal positioning.

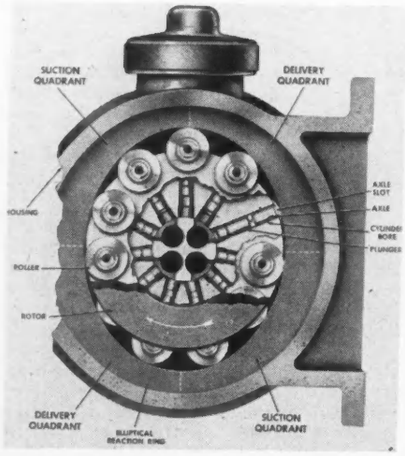
Oil lines are protected from dirt by filter screens. Three to 12-ton capacity jacks are equipped with extension screws which can be hand-raised quickly to load height. Twenty to 50-ton models have fast-working dual pumps. The speed pump raises the jack head to load position where the power pump takes over to finish the job. Horizontal operations are facilitated by pump guard plates which provide adequate working bases when the jack is used in this manner. A safety bypass prevents the ram from being pumped beyond raising limits. Rams and cylinders are high-carbon steel tubing, precision machined and ground for close fitting and ease of operation.

(Check item 6 on postcard for more information.)

7—Hydraulic Pump

A revolutionary method of hydraulic pumping has been introduced by the Superhydraulic Corporation, with the announcement of a radial-type plunger pump. Centrifugal force maintains the plunger rollers in contact with an elliptical reaction ring. The plungers are fitted to cylinders in a rotor in one or more banks of 11 plungers per bank. The rotor rotates on a fixed pintle which has suitable ducts and ports for directing the oil inlet into those cylinders passing through two opposite quadrants, and also for directing the oil delivery out of those cylinders passing through the other two opposite quadrants.

At full delivery, the major axes of the elliptical reaction rings are parallel and at zero delivery, the major axes are 90

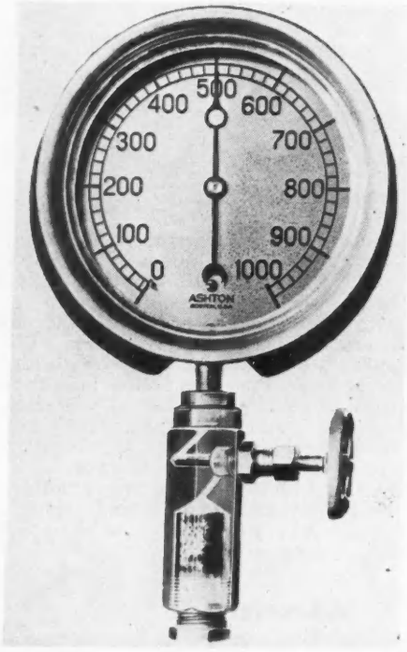


degrees apart. The pump is capable of constant or variable delivery up to 5000 pounds per square inch and 40 horsepower. The double bank series is rated at 17 gallons per minute at 1200 revolutions per minute under maximum pressure with maximum power input.

(Check item 7 on postcard for more information.)

8—Pulsation Dampener

A pulsation dampener for gauges and governors has been introduced by J. A. Campbell Company. Principal purpose of the micro-bean is to eliminate "jitters" in gauges. It is stocked in three I.P.S.



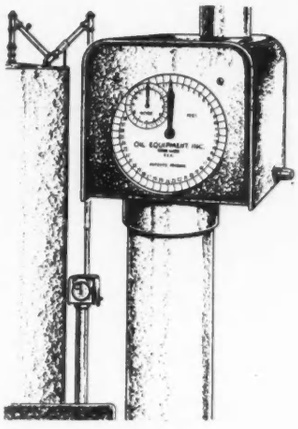
sizes: (female connections on each end) ¼, ⅜, and ½-inch for pressures up to 6000 pounds. It may be used on any gauge line to boilers, engines, pumps, compressors, etc., according to the manufacturer. The new micro-bean is available in both all-brass or all-steel body with stainless steel stem. No piston is required.

The new model overcomes the scoring problem by providing a screw, which when turned slightly will bring back the seating to perfect control. This can be repeated every two years or so, giving the device a life of about 100 years, according to the manufacturer. When the micro-plug eventually becomes scored up, after an estimated ten years of service, the scores can be eradicated by merely opening and closing the valve tightly about ten times.

(Check item 8 on postcard for more information.)

9—Tank Gauge

Oil Equipment Company has engineered a simple, dependable way to measure the contents of oil field tanks in the company's new "Econo-Gauge." According to the manufacturer, the gauge



has only a minimum of working parts.

By means of a specially designed float inside the tank and a counterweight cable, the position or movement of the float or the rise and a fall of the liquid level is transmitted to a grooved drum which in turn, as it revolves, actuates the dial recording mechanism. It is claimed that the slightest change in liquid level with no change in error will be indicated. It can be installed with a liquid seal at the top to prevent evaporation. Design of the weighted float is such that the "swirl" or movement of the float caused by turbulence of loading or unloading are minimized. The gauge proper is housed in a heavy steel case which can be raised easily to expose all working parts for inspection or repair. The case is held in position by a heavy slotted pin, and with a simple padlock through this slot can be made completely tamper-proof.

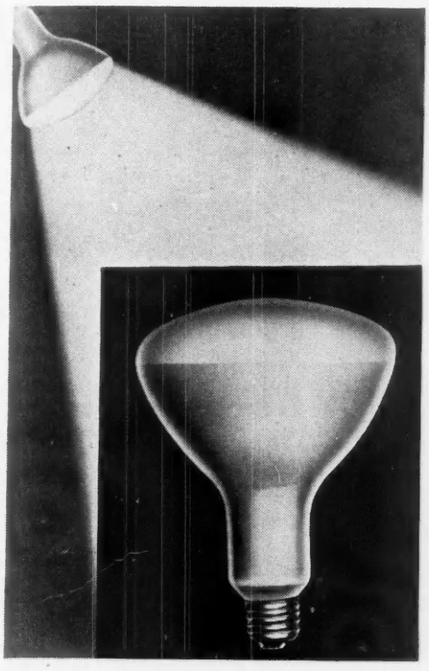
(Check item 9 on postcard for more information.)

10—Floodlight

Especially designed for floodlighting, a sealed-silver reflector unit was recently announced by the Wabash Corporation. The new floodlight has a silver reflector lining which is hermetically sealed inside to prevent tarnish of the reflecting surfaces.

The filament is precision mounted at

the proper focal point to project light in a beam pattern which is concentrated in a 60-degree angle and feathers to a soft diffusion at the edges. It is available

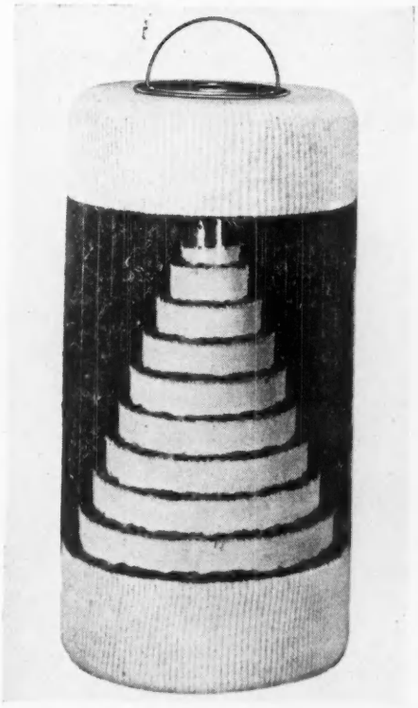


in four sizes from 100 to 300 watts. Each unit is claimed to have a burning life of 1000 hours.

(Check item 10 on postcard for more information.)

11—Oil Filter

Micro-filtration of oil by triple-trapping is the feature of a new oil filter announced by C. M. Fuller Company. It



is said to cleanse contaminated oil thoroughly, removing all damaging foreign substances without altering or reducing additives present in many modern lubricants. Called "Engine-Life," this filter is made in different cartridge sizes to fit all cases.

Long-threaded, lint-free textiles compose the filtering media, scientifically compacted to uniform density. The laminated construction and outside-to-inside flow results in multi-element filtering effectiveness of maximum area for any given size case. A strong, flexible circular seal is built-in as an integral part of the element. The cylindrical perforated core is made of extra-heavy, non-corroding alloy steel.

(Check item 11 on postcard for more information.)

Literature

12—Pumping Jack

A six-page folder has been released by The Pelton Water Wheel Company concerning the company's long-stroke hydraulic pumping jack. Bulletin 33 briefly describes the pumping jack as a deep-well oil pump. This patented pump and associated equipment is shown in an outline drawing which defines each part both from a side view and a top view. A bill of materials lists the 22 principal parts comprising the unit, which is illustrated in actual field installations. Performance specifications, operating data and a list of material to be furnished by the purchaser is included.

(Check item 12 on postcard for more information.)

13—Wire Strain Gauge

A 24-page, standard-size booklet has been published by The Baldwin Locomotive Works describing the SR-4 bonded resistance wire strain gauge. Of particular interest to oil field equipment manufacturers and testing laboratories, this generously-illustrated booklet, Bulletin 179, gives a brief history of strain determinations by bonded resistance wire gauges and explains the underlying principle employed in these devices. Test cases are cited where actual application has been made. Illustrations show the use of strain gauges in testing pipe, rods, and many parts of mechanical equipment which are subject to stresses and strains. A lengthy bibliography on resistance wire strain gauges, stress and strain determinations is listed in the close of the booklet.

(Check item 13 on postcard for more information.)

14—Magnesium Anodes

A 13-page illustrated booklet dealing with the use of magnesium anodes for cathodic protection has been published by the Magnesium Division of The Dow Chemical Company. Descriptive information regarding this method of corrosion control is presented along with answers to some of the more common questions on the subject.

(Check item 14 on postcard for more information.)

15—Electrical Equipment

Electrical equipment for every phase of the petroleum industry is described in a new booklet announced by the Westinghouse Electric Corporation. The 36-page booklet includes photographs showing installation and application of a-c and d-c drilling equipment, including semi-electric and full-electric drives; pumping equipment, including substations for utility power, generators, transformers, distribution apparatus, motors and gearmotor drives, protective and control apparatus, dynagraphs and instruments; and pipe line and marine equipment.

(Check item 15 on postcard for more information.)

16—Compressor Unit

A 20-page illustrated bulletin describing the Cooper-Bessemer "GMX" compressor units has been compiled. The new publication, Bulletin 338, describes in detail the various exclusive design advancement of the compressor. It emphasizes the advantages of horizontal compressor cylinders with V-angle power cylinders in the same vertical plane. The new bulletin also includes a cross-section diagram showing the location of various components, numerous other illustrations of parts, and complete specifications.

(Check item 16 on postcard for more information.)

17—Plastic Coating

A comprehensive, eight-page technical bulletin dealing with combating the corrosion problem by plastic coating has been published by Amercoat Division, American Pipe & Construction Company. The bulletin has been streamlined for ready reference and gives complete factual information in condensed form about the entire Amercoat line. It applies to all industries having corrosion and contamination control problems. The chart shows all characteristics and properties of Amercoat plastic coatings. It is also a guide for selecting the proper coating, preparation of the surface, and application methods on steel, concrete and wood. Cost per square foot for materials, with area formulae, are included.

(Check item 17 on postcard for more information.)

18—Tubing Head

Six detailed cutaway drawings of typical applications of The National Supply Company's type "W" tubing head are featured in Bulletin 327. The type "W" is an extremely flexible unit designed to support a string of tubing and to seal that string from the casing. Through the use of adapter flanges, it can be used with type "B" well head equipment. The bulletin also carries two photographs and technical data on the tubing head bodies and adapter flanges.

(Check item 18 on postcard for more information.)

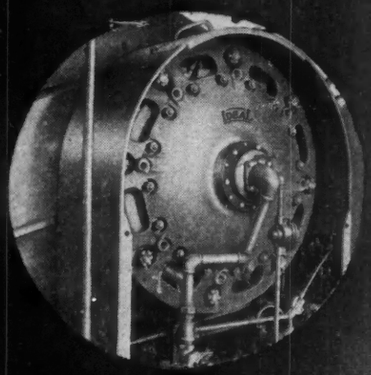
19—Organic Chemicals

A new 12-page booklet, "Physical Properties of Synthetic Organic Chemicals," has been issued by Carbide and Carbon Chemicals Corporation. Data on the physical properties, and applications for more than 175 synthetic organic chemicals are presented in tabular form for ready and easy reference.

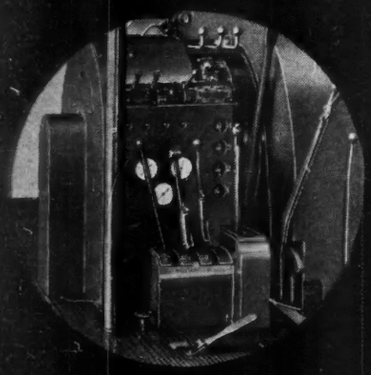
(Check item 19 on postcard for more information.)

IDEAL TYPE 125

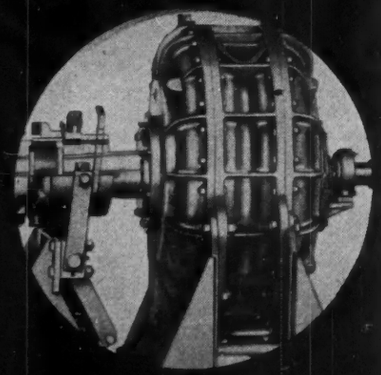
FOR DEEP DRILLING



Ideal Air Friction Drum Clutches Require No Adjustment



Convenient and Easily Operated Controls



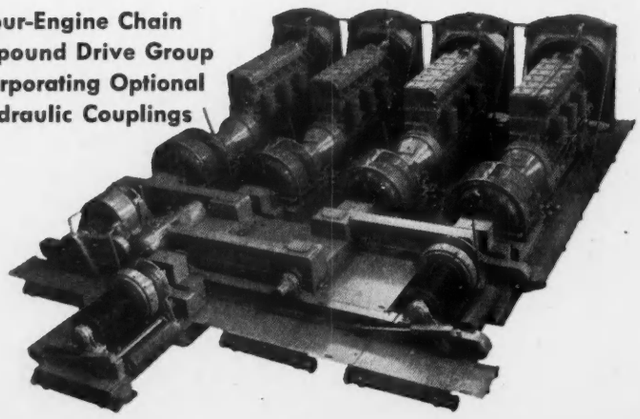
Air Controlled Clutch-Coupling for Hydraulic Brake

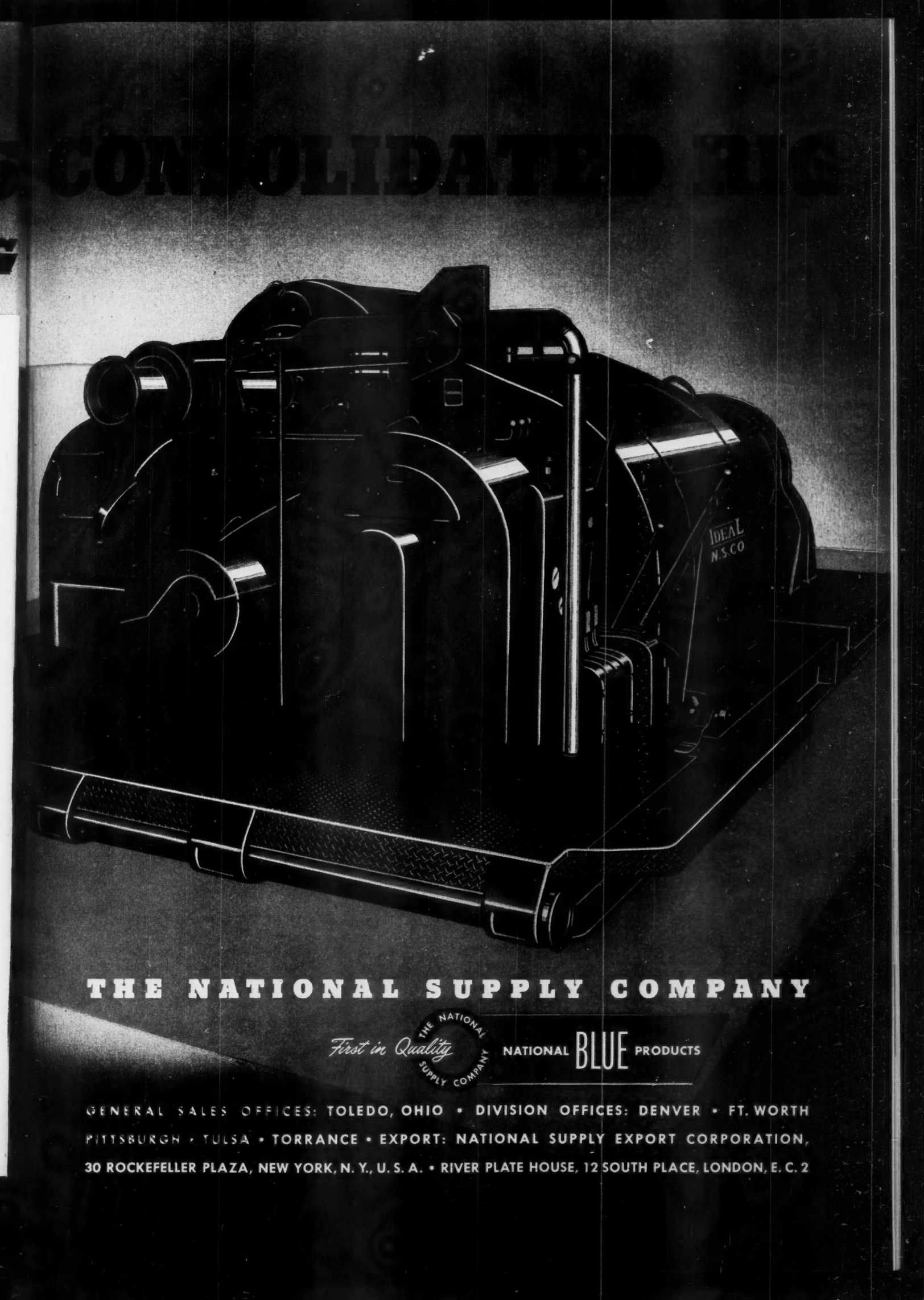
Featuring-

National's rugged Type 125 Rig is equipped with all the essential features for fast economical drilling. A few of the many advantages are: 6 hoisting speeds, 2 empty block speeds and 6 rotary speeds. In addition, this Rig provides—Ideal Air Friction Drum Clutches, Air Controlled Hydromatic Clutch, Full Lubricated Chain Drives, and Air Controlled Engine Throttles.

The six speed drum drive and six speed rotary drive components—including the air operated friction clutches—are positioned outside the supporting line shaft and drum shaft bearings for convenient adjustment.

Four-Engine Chain Compound Drive Group Incorporating Optional Hydraulic Couplings





THE NATIONAL SUPPLY COMPANY

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Crude Production Gains Moderately; Runs to Stills Hit High for Year

Crude production in the U. S. during the week ending August 17 was upped moderately over the previous week, while crude runs to stills increased substantially to reach a new high for the year.

Output of gasoline and residual fuel oil was increased over the previous week, while distillate fuel production was cut back considerably. Stocks of these principal refinery products were all increased after their production had satisfactorily met the week's market requirements. These trends were revealed in the weekly report of the API.

Production of crude oil averaged 4,843,000 barrels daily during the week of August 17, to register a 22,000 barrel per day increase over the previous seven-day period. This average output was 91,000 barrels, or 1.8 percent, less than the daily rate of the comparable week of last year.

Daily crude runs to stills were increased 101,000 barrels over last week bringing them up to 4,907,000 barrels, which is 193,000 barrels, or 3.8 percent, less than runs of the corresponding period of last year.

Stocks of refinable crude totaled 224,098,000 barrels August 10, according to the Bureau of Mines' latest report. This total shows that stocks were reduced by 734,000 barrels during the preceding seven days, but exceed those held one year before by 10,000 barrels, or 4.7 percent.

Gasoline output, upped 506,000 barrels over the previous week, totaled 15,202,000 barrels for the week of August 17. This production, which includes natural gasoline blends, was 927,000 barrels, or 5.7 percent, short of matching the comparable week of last year. Stocks of finished and unfinished gasoline now total 87,036,000 barrels after having been increased 20,000 barrels during the week. Current gasoline stocks top those held a year ago by 1,053,000 barrels.

Distillate fuel oil production amounted to 5,346,000 barrels, a cut back of 389,000 barrels from the previous week, but 166,000 more than was produced in last year's week. Additions of 887,000 barrels of this light fuel oil were made to stocks during the week, bringing them up to 48,917,000 barrels, which is 10,118,000 barrels, or 26.1 percent, greater than stocks a year ago. Distillate stocks are now at their highest level since 1941.

The week's output of residual fuel totaled 8,389,000 barrels, a rise of 188,000 barrels from the previous week, but 1,521,000 barrels less than last year's comparable period. This fuel's stocks now stand at 51,827,000 barrels, showing an increase of 214,000 barrels during the preceding seven days. The heavy fuel oil now on hand exceeds last year's stocks by 6,611,000 barrels, or 14.6 percent.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11–22	4,120	10–18	266,187	3–29	99,727	3–29	[1]54,983	11–15	102,448	1– 4
1942	4,337	2– 7	3,961	1– 3	263,208	3–28	[1]109,281	3–14	47,861	11–14	95,857	1– 8
1943	4,436	11–13	4,331	12– 4	245,752	5–29	94,159	3–20	47,187	11–27	72,881	1– 2
1944	4,762	9–30	4,798	12–30	240,992	1– 1	89,162	4– 1	48,162	10–28	64,744	10– 7
1945	4,944	7–21	[1]5,140	8–18	227,554	10–13	99,012	3–24	45,341	11–17	56,074	1– 6
1946	[1]4,961	6–15	4,907	8–17	229,430	3– 2	105,233	2–16	48,917	8–17	51,827	8–17
Lows:												
1939	[3]1,601	8–26	3,125	2–18	[2]229,127	10–12	71,152	10– 7	20,722	4–15	105,397	4– 3
1941	3,364	1–11	3,490	1–18	240,399	11–15	79,923	10– 4	28,382	4–12	90,914	7–13
1942	3,297	7– 4	3,393	5–23	231,896	12–12	75,934	12– 5	29,240	4–25	72,962	12–26
1943	3,821	1– 9	3,579	3–18	232,191	1– 9	68,182	10–16	30,732	4– 3	57,596	12–25
1944	4,357	1– 1	4,228	2–12	220,258	9– 9	76,302	1– 1	30,232	4–19	49,737	3–18
1945	3,621	10– 6	3,409	10– 6	[4]211,813	8–25	70,791	10–13	26,483	3–17	38,548	5–26
1946	4,403	3– 9	4,498	1–12	218,193	1– 5	86,741	8– 3	25,131	3– 9	37,289	4– 6

TRENDS OF 1945 AND 1946

Trends in Week Ended	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1945:									
January 27	4,727	4,756	221,310	14,957	88,223	4,843	33,561	9,252	51,119
February 24	4,777	4,803	219,351	15,500	95,972	4,958	28,753	9,084	46,713
March 31	4,781	4,677	223,782	14,644	98,758	4,548	26,889	9,184	41,745
April 28	4,805	4,780	223,474	14,633	94,068	4,636	28,273	9,379	39,813
May 26	4,887	4,950	222,831	15,194	89,121	4,667	29,184	9,670	38,548
June 30	4,903	4,999	220,781	15,546	86,472	4,910	32,213	9,077	40,488
July 28	4,930	4,996	218,507	16,106	86,008	4,598	36,071	9,586	42,283
August 25	4,892	4,931	[4]211,813	15,986	84,693	4,960	39,782	9,356	46,201
September 29	4,357	3,812	222,387	11,913	79,552	3,940	43,689	7,047	46,853
October 27	4,273	4,838	224,230	15,530	74,335	5,159	43,472	8,691	45,943
November 24	4,469	4,648	219,363	15,681	83,184	4,802	45,258	8,800	47,474
December 29	4,474	4,729	218,918	14,546	95,205	5,055	36,651	8,765	42,447
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,293	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,357	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,322	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,447
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 3	4,881	4,849	224,832	14,837	86,741	5,556	45,670	8,273	50,138
August 10	4,821	4,806	224,098	14,696	87,016	5,735	48,030	8,201	51,613
August 17, 1946	**4,843**	**4,907**	.....	**15,202**	**87,036**	**5,346**	**48,917**	**8,389**	**51,827**
August 18, 1945	4,934	[6]5,100	[5]214,098	16,129	85,983	5,180	38,799	9,910	45,216
Change:									
In Week	+22	+101	—734	+506	+20	—389	+887	+188	+214
In Year	—91	—193	+10,000	—927	+1,053	+166	+10,118	—1,521	+6,611
In Year	—1.8%	—3.8%	+4.7%	—5.7%	+1.2%	+3.2%	+26.1%	—15.3%	+14.6%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shut down of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, August 18, 1945. [6] Revised.

Secondary Recovery Projects

Cities Service Oil Company has two active secondary recovery projects underway in Greenwood County, Kansas. Work is to include the initial water-flooding of the Patterson property with its 200 productive acres, and completion of the water-flood program now in progress on the joint-interest Seeley-Clopton unit. The unit has a total of 390 productive areas. An ultimate increase of 1,150,000 barrels of oil in gross production is expected from these projects.

Carter Refinery Built

The Carter Oil Company has announced construction of an $8 million refinery in Billings, Mont., which will have a capacity of 15,000 barrels of crude. Carter now has a 9000-barrel plant in Billings which it acquired through purchase of Yale Oil Refining Company properties four years ago. Crude for the Billings plant is from the Elk Basin, Frannie and Oregon Basin fields in Wyoming.

☆ California

Los Angeles Airport Strike Flows at 300-Barrel Rate

Discovery near Los Angeles airport starts to flow at 300-barrel rate; third well completed in East Los Angeles field good for 300 barrels; wildcatting campaign under way in McKittrick area; Coalinga Eocene pool producer flows 2000 barrels; another deep test to be drilled in Casmalia field.

Los Angeles County: Six Companies Fee 1, just west of the Los Angeles airport in 2-3s-15w, which was brought in 3 weeks ago as a 75-barrel pumper of 14-gravity oil from the schist for a discovery, has started flowing at a 300-barrel rate through 1-inch choke from newly gun-perforated interval in the schist conglomerate at 6780-6842 feet. This was the well's original objective, but the formation tested wet and the well was taken on down to the schist and completed. The new development brightens the outlook for this area considerably and additional drilling now appears definite.

Richfield Oil Corporation has completed Vail 2 in 6-2s-12w, the third well to be brought on production in the East Los Angeles field. It is flowing about 300 barrels from 8616-8634 feet.

In the same area C. G. Willis was testing at 9788-9800 feet in Simons 1, 15-2s-12w.

Chanslor-Canfield Midway Oil Company has stopped drilling at 12,930 feet in Bandini 1, East Los Angeles area, 21-2s-12w. Operator has abandoned the lower part of the hole and will run liner and test showings below 9950 feet.

British-American Oil Producing Company and The Texas Company were running formation tester in Bodger 1, Gardena area wildcat in 22-3s-14w, with total depth 9154 feet.

East of the Santa Fe Springs field in 10-3s-11w, Rothschild Oil Company was unable to recover fish in East Santa Fe Springs Community 1, wildcat, and abandoned at 5788 feet. To the north in the Pico area, Union Oil Company abandoned Culp 1 in 7-2s-11w for the same reason.

Orange County: R. W. Jerman reported 2½ feet of oil sand on bottom in Gothard 1, wildcat on the north side of the Huntington Beach field in 27-5s-11w.

Kern County: A substantial wildcat drilling campaign is getting under way in the McKittrick area. East of the McKittrick field, E. A. Parkford prepared to drill a deep test in 22-30s-22e. South of the field, Texas is grading location for West Petroleum 1 in 29-30s-22e, a test of the Eocene, expected at 8000 feet, and Tide Water Associated Oil Company staked Midway-McKittrick 5 in 32-30s-22e. Northwest of the field in 4-30s-21e, General Petroleum Corporation has rig up for a wildcat, Hall-Baker 66-4.

A new try for production in the Devils Den area got under way at S. R. DeKalb's Black 14 in 25-25s-18e. Location is west of the Devils Den field.

Fresno County: Petrol Corporation has completed Crandall 41-18, a 2000-barrel producer in the Coalinga Eocene pool, 18-19s-16e. Well is producing at this rate through a 17/64-inch choke from producing intervals at 8112-21 and 8132-50 feet in Gatchell sand.

Lowry Lytle will drill an outpost test about 1/5 mile northeast of production in the Raisin City field, 12-15s-17e.

Tulare County: Rocket Petroleum Company was testing oil sand logged at approximately 850 feet in Murray 1 in the Terra Bella area, 21-22s-27e. Operator was doubtful of a commercial producer.

Santa Barbara County: Bell-Casmite Oil Company was preparing to drill Morganti 7 in the Casmalia field, 13-9n-35w, as a test for Lospe production. Morganti 6, which found the Lospe dry, is producing 50 barrels of 33-gravity oil cutting 30 percent from an interval up hole.

Union was preparing to make a production test in Sisquoc 6, wildcat in 2-8n-31w. Total depth is 4989 feet.

Ventura County: Rothschild Oil Company has abandoned Dempsey 1, wildcat in 29-2n-11w near Camarillo. No showings were obtained worth testing.

☆ Oklahoma

Grady County Deep Wildcat Shows Gas in Viola Lime

Grady County deep wildcat shows gas in Viola lime; Coon Creek area gets 12th producer; new wildcat to start near Hillsdale field; Big Chief's discovery responsible for new locations; Maysville area has new wildcat location.

Grady County: George P. Livermore, Inc.'s Giles Ranch 1, CNW NW 35-8n-5w, on the Middleburg high, closely watched wildcat, attracted added attention during the week, when a showing of gas was found in the Viola lime, through perforations from 11,779-914 feet. The flow was estimated at ½ million to 1 million cubic feet of gas per day, with a spray of oil. Total depth is 12,253 feet in dry Wilcox sand. Crew was to acidize the Viola lime with 12,000 gallons and if flow fails to increase, will move up the hole to the Hunton lime, which also will be acidized.

Coon Creek Area: The productive Coon Creek field on the Oklahoma-

Wells Completed in the United States in Week Ended August 24, 1946

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second or third issue of each month. More detailed data on wildcats published in third or fourth issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama													10	23
Arizona													1	
Arkansas	5				5						5	3	119	123
California	22	1			23				3	3	26	29	1,203	1,422
Colorado	2				2						2	3	89	19
Florida									1	1	1		16	11
Georgia													2	6
Illinois	20			5	25	2	1		9	10	37	49	1,459	1,173
Indiana	6			5	11				2	2	13	7	334	219
Iowa														1
Kansas	17	2	1	10	30	3	1		7	8	41	41	1,328	1,072
Kentucky	3		1	1	5				4	4	9	15	400	355
Louisiana	11	2		4	17		1	1	3	5	22	19	831	658
North Louisiana	8	2		3	13			1	3	4	17	13	460	241
South Louisiana	3			1	4		1			1	5	6	371	417
Michigan	7	5		7	19				7	7	26	11	496	492
Mississippi	1				1				1	1	2	5	142	246
Missouri									1	1	1		22	36
Montana	2			2	4				1	1	5	5	168	146
Nebraska									2	2	2		3	3
New Mexico	8			1	9						9	13	266	285
New York	15		10	2	27						27	25	774	718
North Carolina													1	1
Ohio	8	4		13	25			1	1	2	27	15	767	615
Oklahoma	40	4		10	54	3	2	1	7	10	67	67	1,770	1,539
Oregon													2	
Pennsylvania	27	4	15		46	1					47	48	2,051	1,914
Tennessee													2	3
Texas	88	13	2	18	121	4	12	2	18	32	157	172	5,267	4,739
E. Tex. Bor. Co.'s	1	5			6				2	2	8	4	117	60
Rest of E. Texas	15		1	5	21		3		1	4	25	19	353	141
North Texas	12		1	8	21	2					23	36	1,527	1,131
W. Central Texas	6	1		3	10	1	4	1	1	6	17	12	405	311
West Texas	28	1		1	30	1	1		2	3	34	32	1,101	1,174
Tex. Panhandle		4			4						4	10	245	394
G. Coast, Upper	3				3		2		5	7	10	19	419	454
G. Coast, Lower	20	1			21		1		2	3	24	21	718	686
Southwest Texas	1	1		1	3		1	1	3	5	8	11	280	325
S. Central Texas	2				2				2	2	4	8	102	63
Utah													2	
Washington													1	
West Virginia	1	14		1	16						16	18	467	515
Wyoming	4	1			5				1	1	6	3	104	104
Total U. S.	287	50	29	79	445	13	17	5	68	90	548	548	18,087	16,438

* Includes distillate wells. † Includes salt water disposal wells.

Logan County line received its 12th producer in Sinclair Prairie Oil Company et al's Cooper 2, SE NE NW 3-14n-1w, Oklahoma County side of the field. With casing set on top of the second Wilcox sand at 5970 feet, the Cooper flowed 555 barrels of oil in 6 hours, with 875,000 cubic feet of gas a day. Hourly gauges showed the following flow: 104 barrels the first hour; 85 barrels the second; 92 the third, fourth and fifth hours, and 90 barrels the sixth hour. Total depth is 6016 feet.

Garfield County: Cities Service Oil Company will start work around September 1 on Schultz 1, SE SE NW 7-24n-8w, wildcat about 2½ miles south of the small Hillsdale field. The venture is in the northwestern corner of the county, where the company has a large lease block on 14 quarter sections in the northwest of 24n-8w. Cities Service also holds 12 quarter sections in 24n-9w, Alfalfa County, and leases in 25n-8w, Grant County. The Hillsdale pool was discovered by Champlin Refining Company in 1938 with Boehm 1, SW SW NE 4-24n-9w, completed for a flow of 275 barrels of oil, same amount of water, per day. Wilcox sand was found at 6658-64 feet and the second Wilcox at 6698-702 feet. Later Champlin's Mackey 1, NW NW SE 4-24n-8w, was completed for 110 barrels of clean oil per day from a total depth of 6703½ feet. The Mackey 2, CS½ NE SE Sect. 4, showed for a stripper, while Boehm 2, NE SE NW Sect. 4, was drilled to 7203 feet in the Arbuckle and plugged after finding water.

McClain County: Two locations have been staked in the area of Big Chief Drilling Company's Stephens 1, CSE SW 24-5n-2w, which recently flowed 286 barrels of oil in 13 hours through ¼-inch choke through perforations at 6561-71 feet in the second Bromide sand. They are Big Chief's White 1, NE SE SE 23-5n-2w, 2 locations west of the discovery well, and Mid-Continent Petroleum Corporation's Kirkland 1, SW SE NW 26-5n-2w, southeast of the discovery. Both wells will try the sand zone that paid off in the Stephens. Magnolia Petroleum Company is taking oil from Stephens 1.

Garvin County: Activity in the Maysville area was stepped up recently when R. H. Dearing & Sons, discoverers of the area, announced location of Rogers State 1, NE NW SE 32-4n-2w. The discovery was McBride 1, NE NW NW 30-4n-2w. The new test, on which work is scheduled to get under way in September, is 2 miles southeast of the McBride. Northwest of the area, Magnolia is working on cellar and pits at Osborne 1, NE SE NE 24-4n-3w. McBride 1 was completed April 14 for 192 barrels of 60-gravity oil per day, from Pennsylvanian sand, 6570-98 feet. Total depth is 6665 feet.

☆ Kansas

Barton County's Ames Pool May Get North Extension

Ames pool of Barton County may be extended north; Chase County cable tool test to go to Simpson; attempt for second producer in old Haller pool fails; new Rutherford oil pool has 2 dry holes; Ellis County wildcat looms as pool opener.

Barton County: Looming as a possible ½-mile north extension to the Ames pool is R. L. Williams et al's Drews 1, SW SW SW 15-18s-11w, which logged good oil shows in the Lansing and Topeka formations. The Arbuckle lime, topped at 3331 feet, will be tested, and if proven dry, operators plan to plug back and test the shows in the higher formations. Wells in the Ames pool produce from Lansing, Simpson and Arbuckle zones.

Chase County: W. E. Nichols et al were moving in for a cable tool test in the NW NW NW of 12-21s-5e, projected to the Simpson sand. A block of 3000 acres has been assembled in Marion and Chase counties, centering around the test, which is about 3½ miles northeast of the old Florence-Urschell pool. This pool was discovered in the early 1920's and has produced more than 10,000 barrels of oil per acre from the Viola lime. R. H. Pierce, W. B. Davis and Kirk S. White of Tulsa own leases in the block, which was assembled by Pierce and Davis.

Haller Area: An attempt to bring in a second producing well in the old Haller pool in Ellis County has failed. A. W. Ault et al have abandoned Meistrell 1, CEL SW NE 10-11s-18w. The test missed the Arbuckle, and was abandoned at a total depth of 3465 feet in conglomerate. Topeka was topped at 2812 feet, and Lansing lime at 3144 feet. The Meistrell was ¼-mile west of the discovery, which produces from the Topeka.

Pawnee County: Magnolia Petroleum Company, seeking to extend production in the new Rutherford oil pool, has completed 2 outpost tests as dry holes. Sharp 1, NE NE SW 8-20s-16w, was abandoned at 3833 feet, after Lansing was cut at 3492 feet and the Arbuckle at 3826 feet. Rutherford 1 "A," NE SW NW 8-20s-16w, was abandoned at 3831 feet in the Arbuckle.

Ellis County: J. C. Farley's Weisner 1, SE SE SE 26-13s-20w, appears to be a new pool opener. Situated a mile northwest of the Pleasant pool, the wildcat topped the Arbuckle lime at 3798 feet, and a drill-stem test at 3798-3804 feet recovered 25 feet of oil-cut mud and some free oil in 15 minutes. Testing continues.

☆ New Mexico

Sparsely Explored Counties Attracting New Exploration

Sparsely explored counties continue to attract new explorations with Humble and Phillips the latest entrants among the majors; Brunson field extension completed from 100 feet of Ellenburger; new Ellenburger strike makes completion tests.

Lea County: Rowan Drilling Company and Penrose's Walden 3, NE NW 15-22s-3e, twin to regular Permian producer on the east side of the Penrose-Skelly field, flowed 139 barrels of oil natural on 5-hour test from Ellenburger perforations at 7495-7565 feet. This well is 1⅛ miles southeast of nearest Ellenburger production, and probably involves a separate "high." Glorietta and Yeso production are also being developed in the immediate area.

Brunson Field: Repollo Oil Company's Brunson 5, ¼ mile north extension for the Ellenburger area, flowed 486 barrels of 42-gravity sweet oil, with

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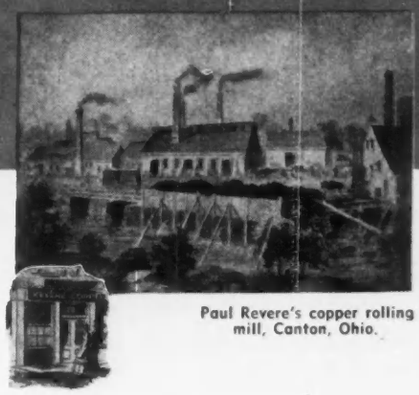

Paul Revere's copper rolling mill, Canton, Ohio.

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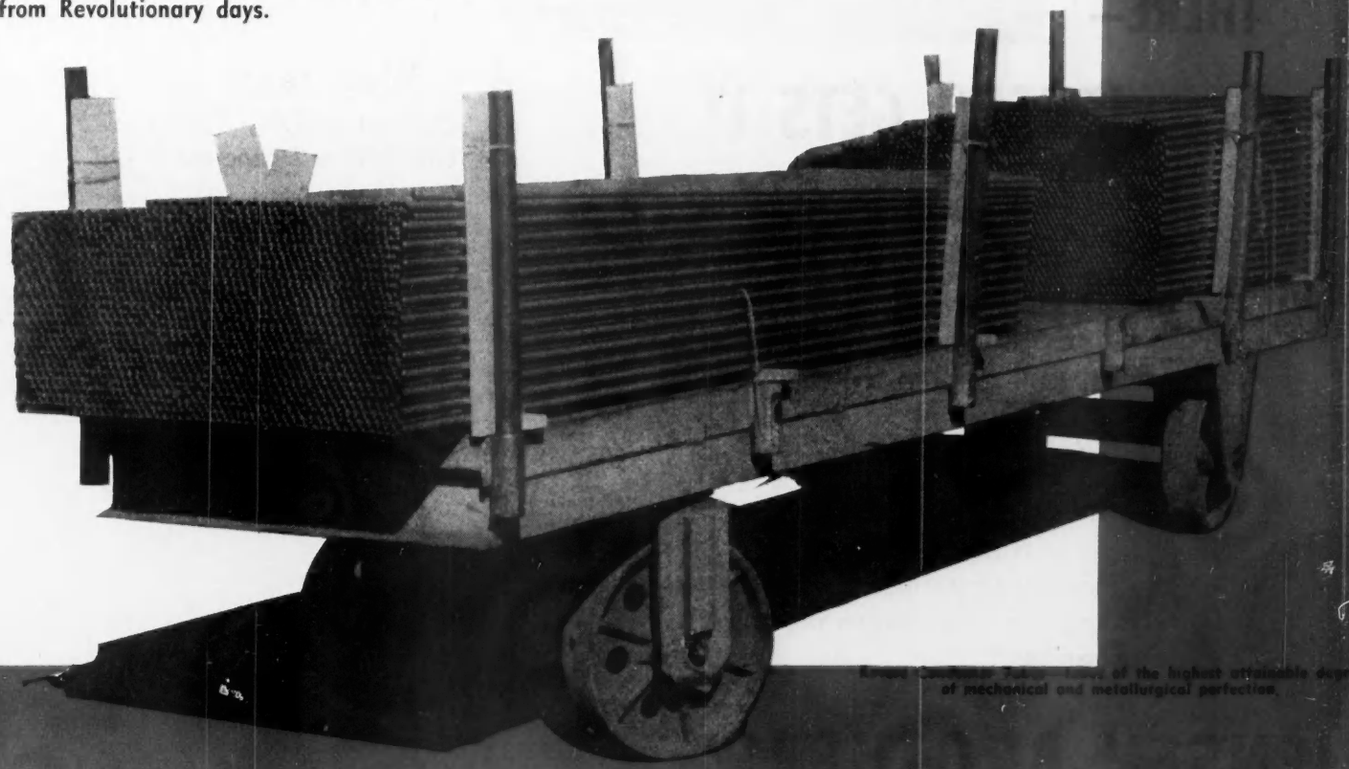

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gas-oil ratio 1076/1, on 14-hour natural test through ½-inch choke from perforations at 7710-7810 feet. Production is from Ellenburger, topped at 7595 feet, or 49 feet high to the offset, and pay continued to solid granite at 7840 feet, which correlates 54 feet high. Amerada Petroleum Corporation's Corrigan 5, C SW NE 4-22s-37e, and ¼ mile north of Brunson 5, is being started as an Ellenburger test. Drilling time in this Ellenburger area has been reduced to 9 to 10 weeks, and completions costs have been lowered to about $100,000.

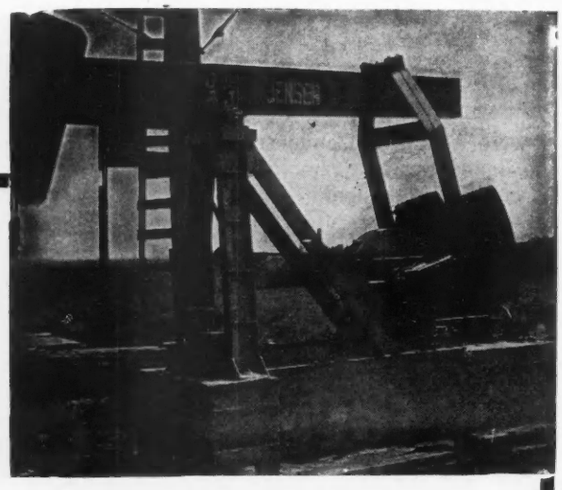
Eunice Townsite Area: Amerada's Hare 1, C SW SW 33-21s-37e, south offset to the most westerly Yeso producer, flowed 135 barrels of oil, with gas-oil ratio 2347/1, natural through ½-inch choke on 15½-hour test from Yeso perforations at 6518-40 and 6549-6608 feet. Treatment with 1000 gallons of acid boosted the flow to 221 barrels of oil and 15 barrels of acid residue on 10½-hour test through ½-inch choke, with gas-oil ratio reduced to 897/1. Hare 1 was deepened from regular Permian pay at 3760 feet, and set 4½-inch casing on bottom. Rig has been skidded location east to deepen Hare 1-A.

Continental Oil Company et al's Lockhart 1-A-35, C NW NW 35-21s-37e, ¼ mile east of the most northly Yeso producer, was showing for a large producer after acidizing perforations at 6508-30 and 6540-50 feet. The Ohio Oil Company's Owen 1, 2 locations south, was testing after cementing 5½-inch casing at 6459 feet, with the well bottomed at 6550 feet. Cities Service Oil Company's Owen 1, C SE SE 35-21s-37e, west offset to the single Yeso producer on the north end of the Paddock field, flowed at the rate of 37 barrels of oil hourly through tester at 6410-90 feet, and set pipe after drilling to 6535 feet. This well confirms the overlap of the Eunice townsite Yeso production into the north end of the Paddock field, but does not prevail in the main sector of the latter.

Wildcats: Repollo's Simmons 1, a mile northeast of the Paddock field, was abandoned in Silurian at 8767 feet, but the hole was not plugged. In Chaves County, DeKalb Agricultural Association's Lewis 1, C SE SW 13-10s-25e, bailed 25 barrels of 25-gravity oil, representing accumulation after 12-day shutdown after dumping 500 gallons of mud acid into the hole. This wildcat was drilled to granite at 5650 feet, and plugged back to 1275 feet to test San Andres saturation passed up. Magnolia Petroleum Company's Black Hills Unit 1, C NW NE 31-17s-20e, was drilling anhydrite and chert at 2315 feet.

Curry County: Humble Oil & Refining Company is starting Northcut 1, C SE SW 32-8n-37e, to explore to the Ellenburger. It is 1½ miles northwest of its Hyslop 1, Deaf Smith County, Texas, failure in granite at 7805 feet that had nominal oil shows in Basal Pennsylvanian and also granite wash, topped at 6510 feet. Homer W. Snowden Oil & Gas Company's Garrett 1, NE NE 26-5n-34e, 15 miles northwest of Clovis, is a projected 4500-foot test.

San Miguel County: Phillips Petroleum Company's Leatherwood 1, NW NE SW 2-15n-18e, 15 miles southeast of Las Vegas, has spudded.



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☆ West Texas

Crockett County Gasser in Ellenburger Deepened to Oil

Crockett County wildcat gasser in Ellenburger deepened to oil zone; structurally low outposts in Block 12 field, Andrews County, due to shorten drilling race against lease expirations; district has numerous discoveries and extensions pending; second sweet crude producer noted on north edge of Goldsmith field; Ellenburger test slated for apex of the structure.

Crockett County: Stanolind Oil & Gas Company's University 1-GG, C SW SW Sect. 12, Block 39, 18 miles southeast of the Barnhart field, nearest production, recovered 515 feet of 38.8-gravity oil and 91 feet of heavy oil and gas-cut mud, with fair volume of gas, when tester was used at 8330-55 feet, or 380 feet in the Ellenburger. This wildcat showed 6 to 8 million cubic feet of gas with distillate spray at 7977-8005 feet, and 10-drill-stem tests at about 30-foot intervals proved dry. This Block 39 prospect is due to cover considerable area, with 2 or more separate zones of production in the Ellenburger as is the case at Barnhart and also the Todd multi-pay field. Stanolind paid the University $1,102,500 cash at 2 auctions for its supporting block of 3845 acres. There are no short-term leases in the area.

Andrews County: The Superior Oil Company's University 4-B-12, west offset to the Clear Fork discovery for the Black 12 field, entered the Glorietta at 5430 feet, or 116 feet low, and was

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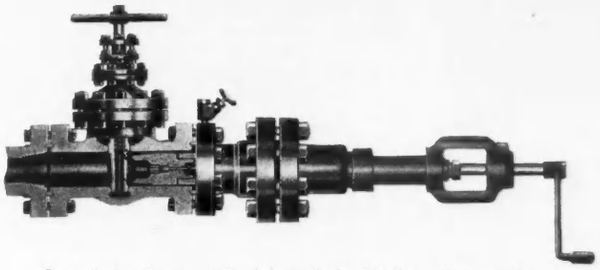

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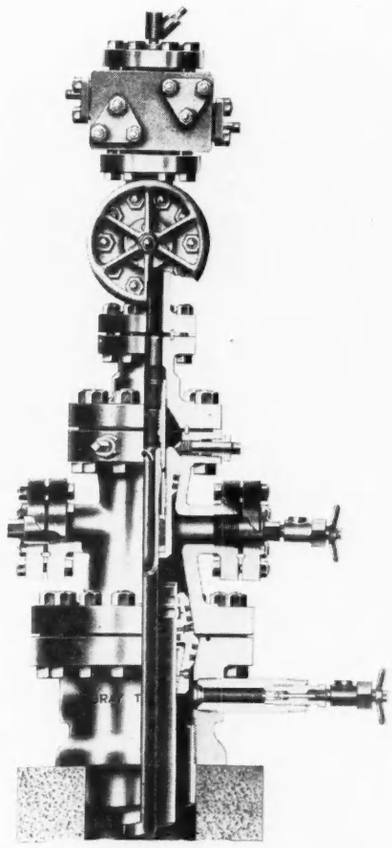

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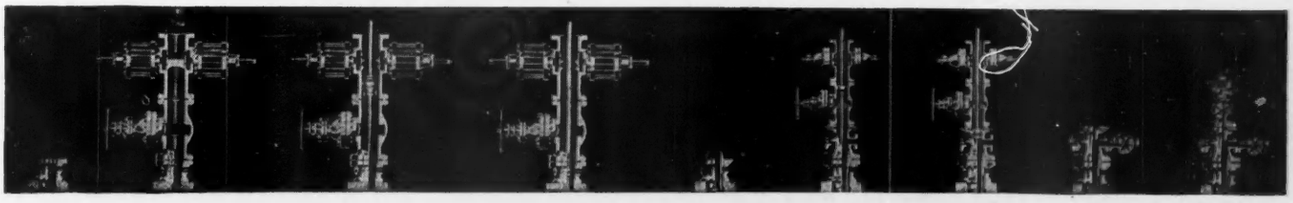

Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

drilling plugs from 7-inch casing at 7063 feet. The company's University 3-A-12, a mile south of the producer, was drilling at 7190 feet in dry lime, having topped the Glorietta at 5540 feet, or 238 feet low. The structural position of these tests casts a discouraging outlook for an expansive producing area, although 8 tests are under way to try for production before leases expire November 14.

Shell Oil Company's Pinson-Humble 1, ¾ mile southwest of the Nelson pool discovery, was running tester at 10,773 feet, having tested oil and water in upper section of the Ellenburger.

Schleicher County: Cooper Gas Company's Koy 2-A, C NE SW GH&SA Railway 38, Block L, ¼ mile west of its discovery oil producer for the north flank of the Page gas field, flowed 1392 barrels of 43-gravity oil and 497,000 cubic feet of gas initial through ⅜-inch choke. Production is from Strawn perforations at 5570-5618 feet, and the zone was treated with 2500 gallons of acid. The well showed oil and water from lower perforations at 5634-64 feet. The south flank of the gas area has a small oil producer.

Menard County: Warren Petroleum Corporation and Tevis F. Morrow's Russell 1, C NE NE Sect. 18, S. Wallick Survey, an isolated wildcat, pumped 21 barrels of 32.5-gravity oil initial from Canyon sand at 2282-90 feet, with hole bottomed at 2307 feet. The partnership's Russell 2, ¼ mile west of the discovery, passed up a small oil show in the Canyon, and drilled barren Ellenburger from 4162 to 4534 feet. The hole was plugged back and pipe set at 3850 feet to test a promising show in Basal Pennsylvanian at 3683-90 feet.

Ward County: Roy D. Golston et al's Moody 1, C W¼ of E¼ H&TC Railway 32, Block 34, and a mile north by west of production in the same zone, flowed 30 to 40 barrels of oil daily by heads after washing broken pay at 2530-50 feet with acid. It will be deepened.

Glasscock County: Shell Oil Company's Clark 1, C NE SW T&P Railway 5, Block 32, T-4-S, was drilling dolomite, tentatively identified as Ellenburger, at 10,115 feet, having tested 1495 feet of salt water on drill-stem test at 9953-10,046 feet. This wildcat tested sweet gas at a rate of 439,000 cubic feet daily with a small amount of oil and salt water from the Pennsylvanian at 9700-9809 feet.

Upton County: Gilcrease Oil Company's University-Superior 1, SE SE SW Sect. 19, Block 14, 2 miles north of the Crockett shallow field, but separated by failures, pumped 8 barrels initial after using 2000 gallons of acid in broken pay at 1428-1512 feet, having plugged back from 1535 feet. Machine has been skidded southwest for a second test.

Loving County: Argo Oil Corporation's TXL 1-C, C SW SE T&P Railway 7, Block 55, 1⅓ miles northwest of the Mason pool, was setting packer to locate source of water, which may be coming from above the pay, after swabbing 18 barrels of oil and 47 barrels of water on 12-hour test from Delaware sand at 3868-3920 feet. The Delaware lime was entered at 3852 feet, with elevation 3071 feet.

Reagan County: Revival of development in the Barnhart 9100-foot Ellenburger field is under way with Skelly Oil Company starting 1 and Amerada Petroleum Corporation has scheduled 3 tests. This field was drilled on a 160-acre spacing pattern, but some operators have completed second wells on the producing unit, and this drainage is to be equalized by additional wells.

Ector County: E. E. Fogelson and Cosden Petroleum Corporation's University 1-C-D, 1⅞ miles southeast of the Ellenburger discovery for the Penwell field, tested sulphur water at 9330-56 feet in Ellenburger, topped at 9316 feet, or 443 feet low. This Ellenburger failure canceled a projected large-scale deep drilling program within the regular Permian producing section of the field. However, it began showing structurally low before reaching pre-Permian beds.

Cities Service Oil Company's Parker-Wentz 1, Harper area, swabbed 41 barrels of fluid, averaging 6 percent bottom sediment, on 12-hour test from Ellenburger perforations at 12,455-470 feet, and will re-treat with 7500 gallons of acid. A commercial producer is doubtful, although a flowing well was indicated during early stages of test. Stanolind et al's Kayser Unit 1, 7¾ miles east by south, was drilling at 13,405 feet in the Waddell (Basal Simpson), topped at 13,300 feet.

Phillips Petroleum Company's Scharbauer-Weyman 1, southeast offset to the Clear Fork flowing discovery on the north end of the Goldsmith field, flowed 170 barrels of sweet oil on 24-hour test through ¼-inch choke after washing with 500 gallons of acid through Clear Fork perforations at 6240-60 and 6275-80 feet. Additional perforations will be made at 6110-6240 feet. An Ellenburger test near the apex of the Permian structure will be announced shortly, while the development of the Clear Fork will be accelerated, with 3 offsets slated for the confirmation well.

Phillips Petroleum Company's TXL 1-J, ¾ mile northeast of production on the east side of the TXL field, is encountering structural dip as sharp as that prevailing on the west side, and was drilling at 9305 feet, with little chance of making a well. The Silurian was entered at 9105 feet, and tested dry at 9176 feet. It is the only important outpost under way.

Winkler County: Humble Oil & Refining Company's Walton 1-E, C SE NW PSL 20, Block 77, ¼ mile west of Ellenburger production in the Keystone field, and off the Ordovician structure, flowed 33 barrels of fluid hourly, ranging from 9 to 12 percent bottom sediment and water, on ⅜-inch choke after using 1500 gallons of acid through perforations at 8247-8550 feet. Production is from the Silurian, topped at 8245 feet, or 348 feet low to the nearest well, Walton 1-E failed to reach the Ellenburger in drilling to 11,156 feet. The Silurian is capable of natural flow without water on top of the structure, and is one of numerous pays that will eventually be tapped, although the oil is low gravity and sour.

The Texas Company's TXL 1-G, ½ mile north by west of pending dual-pay completion in the Wheeler field, was abandoned at 8950 feet in Silurian water, having correlated about 350 feet low. Sun Oil Company's Wheeler 1-A, ½ mile northwest outpost, was completing from open hole at 10,601-630 feet in Ellenburger, topped at 10,587 feet, or 7 feet high.

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☆ Central West Texas

Western Jones County Has Prospective Swastika Strike

Western Jones County has prospective oil strike at Swastika, and pipe set in Palo Pinto lime test; Fisher County discovery finaled; volume of wildcat operations gaining as result of many new operators and companies having entered the district in recent months.

Jones County: V. E. Autry, Ernest Wilson and Paul Steed's Minter 1, NE NE S.P. Railway 39, Block 2, near the Fisher County line, will try for production through perforations opposite the Swastika after recovering good gas flow with 240 feet of oil when drill-stem test was made of this zone at 3438-50 feet. A small show of oil was passed up in the Noodle Creek lime, topped at 2710 feet with elevation of 1906 feet.

Crown Central Petroleum Corporation's Butler 1, William Littlefield Survey 282 and 1¾ miles east of the Fisher County discovery, was running pipe for production test at 4666 feet after a drill-stem test yielded nominal flow of gas.

Fisher County: Skelly Oil Company's Huddleston 1, important Palo Pinto lime discovery, flowed 201 barrels of 45-gravity oil, with gas-oil ratio of 837/1 on 6-hour natural test through open tubing for completion. Production is from open hole at 4345-4405 feet.

Erath County: T. G. Jackson et al's Migel 1, W. B. Waggoner Survey, was showing for a 10-barrel discovery after using acid in open hole at 3314-40 feet. This wildcat was plugged back from barren Ellenburger at 3776-3937 feet.

Stanolind Buys Acreage Near West Central Texas Strike

Stanolind Oil & Gas Company paid $400,000 cash to the Adler Oil Company, Merry Brothers and Perini and associates for their four leases, aggregating 738 acres, adjacent to the Huddleston field 4400-foot Palo Pinto lime discovery by Skelly Oil Company in southeastern Fisher County, West Central Texas district.

The independent group retained one-fourth overriding royalty interest until Stanolind amortizes development costs and regains half the cash bonus, then the properties will be owned on a 50-50 basis. The productive area is expected to embrace from 400 to 600 acres, with prospect of shallower pays. Stanolind's first test will be on the Huddleston 180-acre lease as a south offset to the discovery.

☆ North Texas

Jack County Wildcat Tests Show in Bend Conglomerate

Eastern Jack County wildcat testing gas show in the Bend conglomerate, Almon Field, Cooke County adds deeper oil zone, new pool in Wilbarger County scores second flowing producer.

Jack County: Continental Oil Company's Tom Cherryholmes 1-C, Florida Payne Survey A-1564, and a mile from Stephens Petroleum Company's Jackson 1, which showed for a well in the bend, was preparing to perforate opposite gas showing passed up in Bend conglomerate at 4574-4600 feet and possible oil saturation at 4600-50 feet. It is bottomed at 5626 feet.

Almon Field: Fred Snuggs et al's Almon-Sun 7, Bailey Survey opened a deeper oil zone for this Cooke County area in pumping 120 barrels from Strawn sand at 3934-42 feet.

Wilbarger County: National Associated Petroleum Company's Schmoker 2, SE NW NE H&TC Railway 111, Block 14, and southeast offset to its Victory field discovery, flowed 381 barrels of 35-gravity oil natural, gas-oil ratio 150/1, on 16-hour gauge through ½-inch choke from the Canyon at 3443-91 feet. Rig has been skidded 660 feet east for Schmoker 3.

Grayson County: L. O. McMillan and Sherman Hunt, Jr.'s Thorne 1, Samuel Stewart Survey, and ¼ mile west of the Handy 1600-foot oil area opened recently by The Texas Company, missed the pay, and was drilling at 2560 feet. Texas' Handy 3, offset to the flowing producer, was idle for repairs at 1286 feet.

Standard Oil Company of Texas' Mitchell 1, Sherman prospect, was drilling lime at 11,220 feet in Simpson, topped at 9298 feet, while its Grayson County Poor Farm 1, Strawn prospect, was drilling shale at 4850 feet.

Cooke County: Shell Oil Company and Seitz's Wooldridge 1, W. Wilburn Survey, was drilling lime and shale at 4410 feet, having tested dry on four drill-stem tests of the strawn.

Sinclair Prairie Oil Company's Dawson 1, Block 93, Fannin County School Lands, and 1¼ miles east of the Walnut Bend field, tested 25 feet of rotary mud cut with black oil from sand at 5859-69 feet, and was drilling at 5915 feet.

Clay County: Continental Oil Company's Crump 1, Block 45, Grayson County School Lands, and 1½ miles northeast of Blue Grove, was abandoned at 6315 feet in Ellenburger, topped at 6190 feet.

☆ East Texas

Navarro County Fault-Line Prospect to Test Pettit

Navarro County fault-line prospect due to set pipe for production test of shows in Pettit, Houston County wildcats get water in Woodbine; sub-Clarksville pay may attain importance in Manziel field.

Navarro County: Temple Hargrove et al's Wallace 1, John Jones Survey and near Woodbine production along the Richland-Currie fault trend, was due to halt near the 6200-foot level in the Travis Peak, entered at 5985 feet, and probably will set pipe for production test of gas show in the Pettit.

Houston County: Humble Oil & Refining Company's Legory 1, Francis Hill Survey, was eliminated as a Woodbine prospect in testing salt water at 7324-54 feet. The test was drilling shale at 7930 feet and may continue to the Georgetown for geological information.

Wood County: L. O. McMillan et al's Holley 1, J. M. Moore survey, northeast edge of the Manziel multi-pay field, was setting pipe in shale at 4211 feet to complete from oil sand in the sub-Clarksville at 4170-93 feet. This zone contributed its first producer recently when Rogers Lacy and Caraway's Shamburger 1-A pumped 113 barrels of 16-gravity oil from perforations at 4146-66 feet. This low-gravity oil is in big demand for asphalt.

Amerada Petroleum Corporation's Foster Unit 2, Rodessa test for the Coke field and 2200 feet northwest of the deep-pay gasser at 8080-8130 feet, cemented 10¾-inch casing at 5130 feet in Georgetown, topped at 5105 feet. Plans are to land 7⅝-inch through the Rodessa gas-distillate zone for completion with the large diameter pipe making it possible to later continue to the Smackover if desired. The deep strike was plugged back from barren Travis Peak. Four producers in the Paluxy zone unitized their deep rights.

Smackover Tests: Humble McKnight 1, northeast edge of the Hawkins field, was drilling at 7090 feet, having tested salt water in the Paluxy at 6895-6915 feet. In Freestone County, The Texas Company's White 1, west outpost for the Fairfield dual-pay gas area, was drilling shale at 9790 feet. Travis Peak was topped at 7905 feet.

Smith County: Humble's Mosley 1, ¼ mile north by west of its Mount Sylvan field discovery, was drilling at 2860 feet. Humble's Dowell 1, East offset failure to the discovery, maintained its structural position of being 59 feet low in entering the Glen Rose at 7679 feet. This is also true of Pace et al's failure to the southeast as it entered the Glen Rose at 7708 feet, or 95 feet low to the discovery.

☆ East Texas Border

Whelan Field West Extension Try Is Testing Favorably

West extension to Whelan field testing favorably; gauge announced on gas-distillate discovery in Elysian fields area; Huxley second test completing in Upper Pettit.

Harrison County: In the Waskom area E. C. Johnston's Cargill 1, Holloway Survey, 3½ miles west of Waskom and 1 mile south of Jonesville, was completed as a productive oiler, gauging 43.5 barrels per hour with gas-oil ratio of 400/1. The flow came from 5931-44 feet through 13 feet of oil saturated sand in Travis Peak formation. On a 9-hour test the well produced 48-gravity oil under 500-pound pressure, through ¼-inch choke. This first major oil producer in the area is 1 mile west of the extension of the old Waskom gas field. It is ¾ mile west of the Arkansas Fuel Oil Company's Howell 1, gas well.

R. W. Williams' Furrh 1, O'Neal Survey, recent gas distillate discovery in the Elysian fields area, was gauged at 1,480,000 cubic feet of gas daily, with 12 barrels of 42-gravity oil from the Travis Peak at 6294-308 feet.

Shelby County: Humble Oil & Refining Company squeezed off perforations at 6652-70 feet in Pickering Lumber Company 2, which is 4800 feet southwest of Huxley field's discovery, and second test in the field. Small gas indications were obtained from the Lower Pettit before the well plugged back to test the Upper Pettit in which it was completed.

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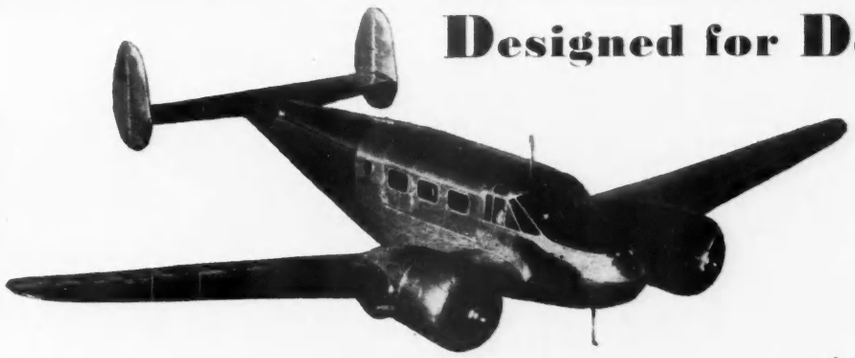

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Type 10-LV Swivel has a conventional bail and duplex angular-contact bearings at the top and single angular-contact bearings at the bottom and is for use with small rotary rigs and rigs having a hydraulic feed mechanism.

Type 10-PD Swivel has a combination bail and pull-down yoke, used on rigs equipped with a mechanical pull-down attachment.

The same angular-contact bearings are used in 10-PD as in 10-LV with positions reversed. Duplex angular-contact bearings are at the bottom and single angular-contact bearings at the top.

The thrusts in 10-LV being downward and in 10-PD upward, accounting for reversal of the bearings. The bearings in these swivels provide ample thrust and radial capacities to insure long and satisfactory service. They are provided with a means of adjustment below the housing. The manner of adjusting the bearings is exactly the same as that on the front wheels of an automobile. A grease nipple in a protected opening, provides a means of lubricating the bearings. A good quality of ball bearing grease should be used.

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☆ Southwest Texas

Yturria Outpost Flows Gas; South Rincon Test Misses Pay

Yturria field outpost flows gas; South Rincon test shut down after missing pay sand; new producing area opened near Mirando City.

Starr County: Sun Oil Company's B. G. de Garcia 3, wildcat outpost 3500 feet southwest of the Yturria field, is testing gas with no gauge taken after drilling to total depth of 6380 feet in sidetracked hole. The gas is from perforations at 6318-33 feet. Original total depth was 6703 feet but operators sidetracked at 5900 feet to straighten hole.

In the new South Rincon field, D. D. Owen & W. H. Holland's Garcia 1, 850 feet southeast of W. D. Kennard's Garcia 1 discovery, shut down for orders after missing the 3500-foot discovery pay sand. The test was drilled to 4500 feet and probably will be abandoned. It is in the northwest corner of Block 18, Porcion 91.

Webb County: Killam & Hurd's J. G. Garcia Hrs. 1, wildcat a mile east of the Mirando City field and 5½ miles south of Mirando City townsite, has opened a new producing area. The well has been completed on pump for 109 barrels of 21-gravity oil daily, with 25 percent water, and gas-oil ratio 50/1. Production is from perforations at 1872-74 feet. Total depth is 1920 feet and 5½-inch casing is set to 1919 feet. The well is in Block 47, Survey 593, Los Ljuelos Grant.

☆ South Central Texas

Southeast Extension Well at Charlotte Is Gauged on Pump

Southeast extension well at Charlotte gauged on pump; second producer for Fashing field completed; Luling area wildcat abandoned.

Atascosa County: The Texas Company's R. B. Love 1, southeast extension well at Charlotte field, gauged 36 barrels of 31.6-gravity oil with no water per day on pump during potential. Gas-oil ratio was 560/1. Production is from the Navarro sand with perforations at 5187-97, 5208-22 and 5252-60 feet. Total depth is 5355 feet. Love 1 extends production 1½ miles east-southeast of Humble Oil & Refining Company's Johnson 1, nearest previous oil producer from the Navarro sand in the Charlotte field. About a mile south-southeast of the Love 1, Texas' Earl D. Scott 1 drilled below 4150 feet in shale.

H. R. Smith & Skinner & Eddy Corporation's Schumann 1 has been completed as the second producer in the Fashing field. On potential the well flowed 138 barrels of oil daily through ⅛-inch choke with gas-oil ratio of 700/1, and with tubing pressure 875 pounds and casing pressure 1475 pounds. Total depth is 3813 feet with 5½-inch casing set on bottom and perforated for completion at 3786-94 feet. The Schumann 1 is 934 feet northwest of the Wiegang 1 discovery well and in the A. S. Donovan Survey 145.

Guadalupe County: United North & South Development Company's J. F. Webb 1, wildcat 4½ miles southwest of Luling, has been abandoned at 2525 feet. Four-inch liner was set in the test to total depth and perforated at 2421-53 and 2485-2505 feet in the Austin chalk and Serpentine for production try. Initially the well pumped 50 barrels of oil daily and then pumped dry. Operators acidized but were unable to get any production.

L. A. Nomads Plans

Los Angeles Chapter Nomads has announced its fall festival, comprising a barbecue and barn dance, will be held on the evening of November 2. The next meeting of the chapter is scheduled September 11. As is customary there, no meeting was held in August.

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☆ Lower Texas Coast

Burnell-Wilcox Field Outpost Has Oil on Drill-Stem Test

Burnell-Wilcox field outpost recovers oil on test; casing set in Ike field outpost; deep test at South Clara Driscoll to get production try.

Bee County: Stewarts & George R. Brown's Brinkoeter 1, southwest outpost at Burnell-Wilcox field, recovered oil on drill-stem test of a saturated sand above 6769 feet. The test was made at 6760-69 feet in the lower part of the Wilcox zone and recovered 150 feet of oil and 190 feet of salt water with 300 pounds working pressure. Flow was through ¼-inch choke and tool was open 15 minutes. The Brinkoeter 1 is 4000 feet southwest of production in the Burnell-Wilcox field.

Live Oak County: Coquat & Continental Oil Company's Albert West 1-C, ½ mile northwest of Continental's Albert West 1-B discovery at Ike field and 4½ miles northwest of George West, had 7-inch casing set to 6792 feet and was preparing to perforate for completion. A drill-stem test at 6782-87 feet recovered 75 feet of amber condensate and developed 170 pounds working pressure with tool open 13 minutes; a test at 6786-91 feet recovered 390 pounds of oil and developed 170 pounds working pressure with tool open 13 minutes; and a test at 6788-92 feet recovered 3300 feet of oil with tool open 25 minutes.

Nueces County: Magnolia Petroleum Company's Dallas Land Bank 3, deep wildcat on the southwest flank of the shallow South Clara Driscoll field, was setting casing after running electrical log to total depth of 9606 feet. Deepest production in the field is from just above the 6600-foot level, with 2 wells producing from that depth, and with the remainder of the field's production coming from the 5700-foot level. Dallas Land Bank 3 is 330 feet from the southeast line and 2310 feet from the northeast line of Sect. 106, Gorge H. Paul's subdivision, Robert Driscoll Ranch, and 1320 feet south-southwest of the No. 2 well.

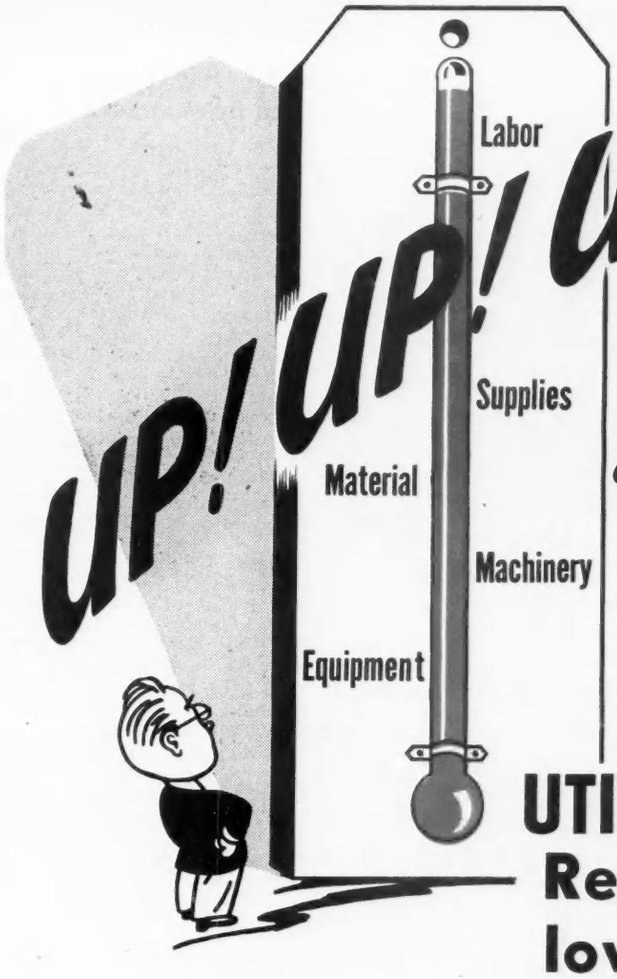
Executive Development by Jersey Standard Planned

Expansion of the executive development program of Standard Oil Company (New Jersey) and appointment of an advisor to coordinate the work of training future leaders for the business have been announced by Eugene Holman, president.

Holman, declaring that business constantly must seek ways to be of greater service to the public, said the program is intended to develop a reserve of executives of broad training and experience for Jersey Standard and affiliates.

Appointed to activate the program is George B. Corless of Houston, geologist and mining engineer who recently resigned from Humble Oil & Refining Company, a subsidiary company. He will maintain liaison with affiliated companies in exchanging techniques in carrying on the executive training program.

Corless, a graduate of the University of Michigan, joined Humble in 1927 following several years of geological and mining work in Joplin, Missouri. He is a past president of the petroleum division of the American Institute of Mining and Metallurgical Engineers.



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☆ Upper Texas Coast

Three New Wells Assured in Matagorda County Field

Three new wells at Sugar Valley assured; test in El Maton discovery area flows salt water; west flank test at Caplen has oil flow; McCoy field southwest extension well shut in after gauging good oil flow; link test between Silsbee and West Silsbee gauges 100 barrels oil on potential.

Matagorda County: In the Sugar Valley field 3 new oil wells are assured. On the east side of production Skelly Oil Company's Travis Dodd 2, 1444 feet southeast of Dodd 1, is completing 5½-inch casing to 9095 feet. The test after drilling to 9204 feet and setting is reported to have good sand section with oil show as well as sands with gas and condensate shows. Skelly's Robertson 1, northeast offset to Talcott 1, also on the east side of production, is drilling below 8923 feet after recovering oil on 2 drill-stem tests. A test at 8852-58 feet and another at 8860-68 feet recovered considerable amounts of 32-gravity oil with good pressures. The Texas Company's Longmire 1, west offset to production on the northwest side, is perforating for completion with total depth of 9075 feet and 5½-inch pipe cemented on bottom. The test is in Lot 1 W. S. Gillette Subdivision of the Burnett & Sojourner Survey and is the offset to Skelly's Lawrence 1.

Ralph A. Johnston's Live Oak Farms 1, 4500 feet south of Magnolia Petroleum Company's discovery in the new El Maton area northeast of Blessing, showed salt water on initial test of perforations at 8587-93 feet. These perforations are being squeezed and sands topped at 8470 feet with oil show will be tested.

Galveston County: Johnny Mitchell et al's R. P. Smith Unit 1, No. 21, on the west flank of production at Caplen, flowed oil and wash water on initial test of perforations at 4031-35 feet. Flow was through ⅛-inch choke with 450 pounds pressure on tubing and 550 pounds on casing. Total depth is 7800 feet with 5½-inch casing set to the 5300-foot level.

Liberty County: The Ohio Oil Company's Kirby 1, Tract 3, southwest extension for the McCoy field, flowed 12 barrels of 32-gravity oil hourly through 10/64-inch choke and was shut in for lack of storage space. Production is from perforations at 9136-44 feet with total depth of 9773 feet. The well is 5700 feet southwest of the discovery in the James McCoy League, Abstract 310.

Hardin County: American Republics Corporation's E. P. Elliott 2-E, link test between the Silsbee and West Silsbee fields, flowed on potential 100 barrels of 41.7-gravity oil daily through ⅛-inch choke with 645 pounds flowing pressure on tubing and 2025 pounds casing pressure. Gas-oil ratio is 714/1.

Magazine to Celebrate

The Texas Company's magazine *Lubrication* will celebrate its 35th anniversary in the August issue, with features on the magazine's history and a brief biography of Allen F. Brewer of the technical and research division, editor for almost 25 years.

☆ South Louisiana

Third Mamou Field Producer Is Completed by Magnolia

Third producer completed at Mamou; Phillips tests deep sand at Crowley; new Egan producer waiting on potential; new sand discovered at North Elton; Plains area wildcat in East Baton Rouge Parish abandoned.

Evangeline Parish: The third producing well for Mamou field is Magnolia Petroleum Company's Walter Reed 1, completed for potential of 230 barrels of oil daily. Flow was through 8/64-inch choke with 2850 pounds flowing pressure on tubing. Production is from perforations in the Wilcox at 11,549-569 feet with a saturated sand section logged from 11,545-575 feet. Total depth is 12,050 feet and 7-inch casing is set on botton. Reed 1 is a north offset to the discovery well and is in SW NW 5-5s-1e.

Acadia Parish: Phillips Petroleum Company's Jeffers 1, deep test ¼ mile north of shallow gas production in the Crowley field, is testing sands topped at 9840 feet. Total depth is 10,520 feet with 5½-inch casing set to 9907 feet.

In the Egan field, Sun Oil Company-Sohio Petroleum Company's W. L. Trimble 3, in 31-9s-12e, is waiting on potential after flowing on latest test 82 barrels of oil daily through 7/64-inch choke. Production is from perforations at 10,102-106 feet and total depth is 10,582 feet with 7-inch casing set to 10,580 feet.

Allen Parish: Lloyd H. Smith's William Rees 1, on the east side of production at North Elton field, has been completed in a new sand as a gas-condensate well. From perforations at 6044-46 feet the well flowed 18 barrels of condensate and 1,320,000 cubic feet of gas daily through 10/64-inch choke. Tubing pressure was 2300 pounds and there was a flow of 6 barrels of water along with the condensate. Total depth is 7615 feet with 7-inch casing set to 7430 feet.

East Baton Rouge Parish: Union Producing Company et al's East Estate 1, wildcat in the Plains area in 52-4s-1w, has been plugged as dry after drilling to 11,235 feet. Several cores were taken in the test but there were only minor shows. The Wilcox was topped at 9413 feet.

Indian Lands Offered

Sealed bids for oil and gas leases on Indian lands will be opened at the Kiowa Indian Agency in Anadarko, Okla., September 11. Bids will be received on tracts in Caddo, Cotton and Comanche counties.

☆ North Louisiana

Plain Dealing Area Deep Test Has Small Oil Showing

Small oil show obtained in Plain Dealing area deep test, Bossier Parish; 3 new zones testing; interest centered on Longwood area test, Caddo Parish.

Bossier Parish: Barnsdall Oil Company's Carter Burton 1, wildcat in 26-23-13w, Plain Dealing area, reputedly had a small showing of oil on drill-stem test, with 48 stands of clear fresh

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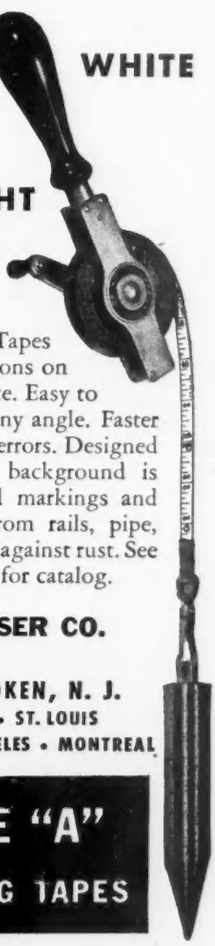

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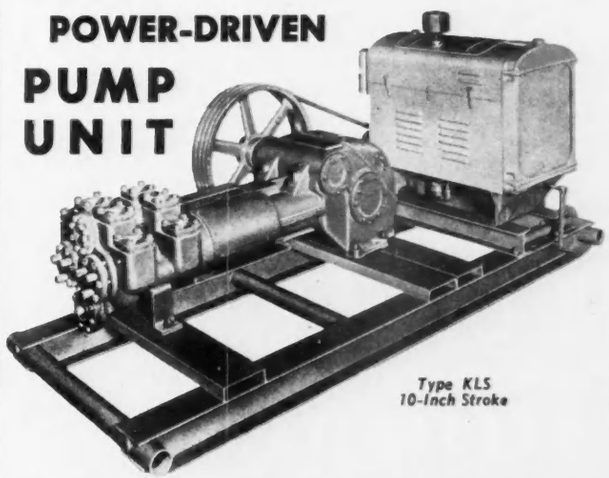

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water, at 9830 feet. The water came from rat hole and a leaking valve. Operators decided to plug back and test farther up in the Cotton Valley. Testing was continued in 3 new zones with 10-shot perforations at 7190-7200, 7150-55 and 7070-75. All were squeezed and perforations made from 7090-7130 for possible tests. The well went to 12,365 feet, then plugged back for testing various zones and sands.

J. B. Blanchard's J. T. Wurtsbaugh et al 1, wildcat in 35-20-11w, was completed at 2525 feet as a 3 million cubic foot gasser.

Caddo Parish: Keen interest is being centered in Joe Burnham et al's Noel 1, 11-19-16, Longwood area, which was reported checking 52 feet high over Union Producing Company's Noel 1, same area, near Mooringsport, having picked up an addition 6 feet during the week. The Burnham test found the base massive anhydrite at 4464 feet, and topped the last stringer at 4508 feet. The Kilpatrick zone was found from 4467-72 and preparations were made for electrical log of that zone, which, if found with oil indications, will be tested at once.

Claiborne Parish: With an apparently dry hole on hand, The Ohio Oil Company and Gulf Oil Corporation took over operation of Blackwell Oil & Gas Company's Waller Sherman 1, in 23-23-8w, Holly Ridge area. The test is now bottomed below 10,242 feet, and reputedly failed to cut the fault in the East Haynesville-Smackover lime section.

Louisiana Allowable

Purchasers of crude at a statewide hearing August 15 asked that the Louisiana allowables be continued at the present high rate.

B. A. Hardy, chairman of the Louisiana Mineral Board, in asking for a cut, said that stocks are piling up but company representatives declared that there is no abnormal accumulation of crude.

☆ Arkansas

Ouachita County Wildcat Tests Oil in Maekin Sand

Ouachita County wildcat tests oil in Maekin sand; fault-line play stimulated with proposed wildcat in Miller County; Chicot wildcat tops Cotton Valley.

Ouachita County: Joe Mucher, Trustee's Josie Smith 1, C NE SE SW 30-15s-17w, 4000-foot test 3 miles east of Gum Creek, is drilling below 2360 feet. A good show of oil was logged in Meakin sand at 2205-17 feet. On a 30-minute drill-stem test 240 feet of oil and mud were recovered, though commercial production is not assured. The test is on a fault line play.

Miller County: J. K. Wadley may drill a Paluxy wildcat in SE SW 16-17s-27w, 3 miles southwest of Fouke field, also on a fault-line play in an area comparable to the new Spirit Lake field.

Chicot County: W. O. White's important wildcat, George Hudson 1, C NE NW 8-16s-1w, picked top of Cotton Valley by samples at 3680 feet and is drilling below 4640 feet in hard sand and chalk without commercial showings. The test will go to 6000 feet, believed sufficient to test the Smackover.

☆ Southeastern States

Mississippi's Cranfield Field Shows Increasing Activity

Activity increases in Cranfield; state's prospects have quiet week.

Adams County: The Ohio Oil Company's Geo. W. Armstrong 1, SEc 12-5n-3w, Massive sand prospect, is drilling below 3412 feet for the county's only wildcat. Well will be driven below 10,000 feet with potential productive horizons at approximately 5000 and 9000 feet in the Wilcox and Massive sand zone, respectively. The Pure Oil Company is set for another development well in the Carthage Point field with Geo. W. Armstrong 1, 13-6n-3w. The field saw little or no development last year and the new test may determine future prospects. In Cranfield, activity is again on the increase after several months' lull. Gulf Refining Company's Ella G. Lees 6, NEc 71-7n-1w, has set production casing to 10,383 feet after encountering good shows in cores of the Massive sand zone. The California Company's Ella G. Lees 19, 39-7n-1w, Cranfield, is drilling below 9458 feet with no shows reported.

Lincoln County: Roeser & Pendleton's Columbus Lumber Company 1, NE NW 20-6n-6e, wildcat, is drilling below 10,460 feet in the Lower Tuscaloosa zone with no shows reported. Humble Oil & Refining Company's Lincoln County Board of Supervisors 1, 16-8n-5e, has set surface casing for its Massive sand test, projected to 10,000 feet. In the Brookhaven field, most active field in the state at present, Sun Oil Company's Leon Case 1, NEc 17-7n-7e, is running core tests below 10,792 feet in the Lower Tuscaloosa. The well has not yet yielded anything encouraging. Cores from 10,756-758 feet recovered only silty shale.

Issaquena County: Plymouth Oil Company's Anderson-Tully 1, NWc 13-9n-9w, wildcat on the flanks of the Sharkey platform, is drilling below 4756 feet with Massive sand zone topped at 4362 feet. Cores from 4717-22 feet recovered sand and shale with no shows.

Grenada County: J. R. Lockhart's Guy Fite 1, NEc NW NW 25-22n-6e, shallow test, is coring below 2950 feet with no shows. A drill-stem test at 2697-2731 feet recovered only fresh water.

Wayne County: Humble's E. L. West 1, NE SE 18-9n-7w, wildcat, is drilling below 7287 feet after several sidewall cores of the section recovered sand with no shows.

Marion County: Humble's E. A. Ball 4, SEc 20-2n-14e, Hub field is bottomed temporarily at 9125 feet while running electrical log. The well looks good for a commercial producer after coring a fair section of gas sand at 9049-75 feet and oil sand at 9119-25 feet. Drill-stem tests of the Wilcox section below 3415 feet, however, recovered only mud and salt water.

Clarke County: L. J. Roussell's Long Bell Petroleum Company 2, NEc SW SW 10-2n-16e, Quitman field, is preparing to run production tests after setting casing to 3820 feet. In the Langsdale field, Kirby Petroleum Company's Long Bell Petroleum Company F-3, SE SE NE 30-1n-18e, is waiting on pump after perforating 3 sections of the Eutaw zone preparatory to production tests.

Alabama

C. H. Murphy, Jr.'s R. E. Eaton 1, NE SE 34-19s-16w, Pickens County wildcat, was preparing to test after reaching 4590 feet in hard sandstone section. No shows have been encountered in lower sections of the hole.

Florida

Gulf Refining Company's State 1, SWc 2-67s-29e, Monroe County deep test, is continuing with coring operations below the 10,800-foot levels. Cores taken previously at 10,676-86 feet recovered hard lime with slight shows of oil, but cores taken below that point have recovered lime and dolomite with no shows indicated. Drilling is below 10,843 feet.

Collier County: Humble Oil & Refining Company's Gulf Coast Realty Company 8, SW SE 19-48s-30e, Sunniland field, is drilling below 10,892 feet with no shows indicated. Humble also has rigging up for a wildcat, Lee Cypress Company 1, 28-47s-49e, which is scheduled for 10,000 feet.

Tennessee

Stevens Petroleum Company's wildcat on the Mitchie Prospect in Tennessee, 10 miles north of Corinth and 12 miles southeast of Selmar, is shut down at total depth of 4004 feet to fish for drill collar. The wildcat has been drilling since spring but had difficulty with pipe and has to recement both 10-inch and 8¼-inch strings. The test will be carried to the granite unless important showings are found above that point.

☆ Michigan

Montcalm County Wildcat Has Show, Prepares for Test

Montcalm Development Corporation's Pollard 1, NW NW NE 8-11n-5w, Montcalm County, 5 miles northwest of the old Crystal oil field, logged Dundee dolomite at 3393 feet and bottomed to test at 3408 feet after samples showed oil saturation. Hole was carrying 3000 feet of water from Traverse, which had not been cased off, when Dundee section was penetrated.

Stewart and White abandoned Fee 1, NE SW NE 24-12n-6w, south of the Belly Achers pool, after drilling water formation at 3433 feet. Top was logged at 3408 with a light oil show at 3414 feet.

Tuscola County: Palmer Oil Company's Palm Book 1, SE SE SW 31-14n-11e, wildcat, pumped 76 barrels oil 15 barrels water on 8-hour test after plugback from 3735 feet to Dundee oil pay at 2680-88 feet. Company plans to start 2 more tests in the area.

Osceola County: Sohio Petroleum Company resumed coring at 5073 feet on Buxton 1, N½ SE SE 13-17n-7w, southwest offset to the Garfield-Orient 5070-foot Richfield sand gas-distillate well completed last spring by The Pure Oil Company. On second drill-stem test, Sohio's offset still failed to show gas pay comparable to the discovery. A test at 5044-61 feet showed 810,000 cubic feet gas and a second test at 5061-73 feet showed 60 feet gas-cut mud. Discovery produced 26½ million cubic feet in a comparable section.

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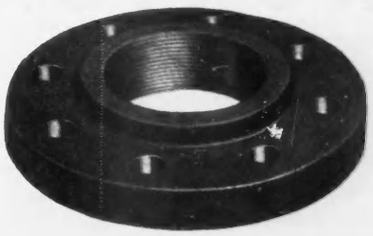

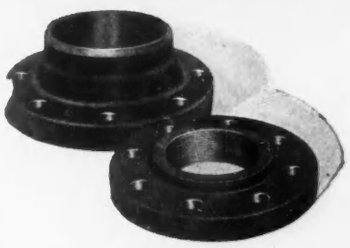

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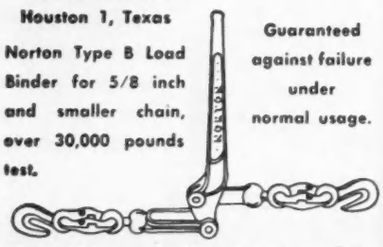

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☆ Illinois Basin

New Pool Is in Prospect for Gallatin County, Illinois

New pool in prospect for Gallatin County, Illinois; Cumberland County pool discovery is completed; interest in Devonian lime mounts; Richland County has big producer; Indiana pool being extended.

Illinois

A new pool is in prospect for Gallatin County at Joe Reznik's Valter 1, SE SE NE 3-9s-9e, where pipe has been set at 2720 feet for a production test of Aux Vases sand. During a drill-stem test of a zone at 2726-34 feet, the well made gas in 27 minutes, and showed 240 feet of oil and 60 feet of oil-cut mud.

Cumberland County: National Associated Petroleum Company's Krogmann 1, NW NE SE 31-9n-7e, has been completed as the discovery well of the Lillyville pool. Producing from McClosky lime at 2454 feet, the well initiated 117 barrels of oil in 24 hours on pump.

Coles County: With National Consumers Oil Company drilling plug to test Devonian lime at Herkimer 2, SW NW NE 11-12n-7e, in the north part of the Mattoon pool, interest in the deep lime is on the upswing. Tex Harvey's Bareither 1, SE SW NW 35-13n-7e, 2 miles north of the Herkimer test, is drilling below 2100 feet on the way to the Devonian in wildcat territory. The Harvey test is located on farm out acreage of The Carter Oil Company.

Richland County: Perry Fulk's Long 1, SE SW SE 12-2n-9e, southeast Decker township, is one of the largest producers in Illinois in several months. The well made 1847 barrels of oil in the first 24 hours after it was brought in and was still flowing from 1500 to 1800 barrels daily through casing set at 3160 feet with swab in the hole. Production is from McClosky lime.

Indiana

Justrite Drilling Company's Hendricks 1, SW SE 31-6s-11w, Posey County, is extending the Vernon Heights pool ¼ mile southwest. Treated with 5000 gallons of acid, the well yielded 222 barrels of oil in 24 hours from McClosky lime at 2475-83 feet.

☆ Ohio

Morgan County York Extension Try Comes in As Good Gasser

York extension makes fair gasser; Brush Creek wildcat is small gas well; Salt Creek has large gas well and small oil extension; Hemlock Grove pool has well on east edge.

Morgan County: In western York Township, Ohio Fuel Gas Company's M. E. Hull 3, SE NE 34, drilled through 28 feet of hard Clinton sand with a natural open flow of 800,000 cubic feet of gas. After a 40-quart shot, the well was tubed and shut in at 1¼ million cubic feet.

Muskingum County: Ohio Fuel's Estella Buchanan 1, NE NE 15, wildcat test in the northwest corner of Brush Creek Township, had 48 feet of Clinton sand at 3687-3735 feet with 200,000 cubic feet of gas. The well was shot with 30 quarts and gauged 400,000 when shut in.

Wasson Company's Roy A. McConaha, SE SW 21, Salt Creek Township, east offset to Murphy 3, was drilled 17 feet in the Clinton with a natural gauge of 7 million cubic feet and a rock pressure of 1270 pounds.

John Morrow's H. A. Corbin 1, NW SE 10, Salt Creek Township, a mile extension to the Salt Creek pool, came in as a small well. Medina sand made 11 barrels at 4270-73 feet.

Meigs County: Nollem O. & G. Company's W. B. Jeffers 4, SE SW 33, Orange Township made 45 barrels after shot. Berea sand at 1754-65 feet shows no thinning to the east.

☆ Rocky Mountain Area

Oil in Muddy Sand Tested by Crooks Gap, Wyoming, Project

Crooks Gap prospect, Fremont County, Wyoming, tests oil in Muddy sand; Sand Draw test has new producing horizon; Sweetwater County has good gas producer; Moffat County, Colorado, project plugs back to Weber after testing water in Madison; Texas to begin important test in Bowdoin gas field, Phillips County, Montana.

Fremont County: At Crooks Gap, Sinclair Wyoming Oil Company's Unit 5, NW NW NE 19-28n-92w, on drill-stem test made 3485 feet of oil in the Muddy sand between 4919-4963 feet. Although some staining has shown in other wells drilled in this field, this is the first test that has been made and may lead to Muddy sand development in the field. The well is continuing to the Lakota sand, productive in 5 other field wells, at around 5200 feet.

Sinclair Wyoming has discovered another producing horizon in its Sand Draw Unit 3, SE SE SE 10-32n-95w, which has been testing shows in the lower Embar (Phosphoria) formation. The well was scheduled as a Tensleep sand producer, but logged considerable staining in the Embar, so casing was set on top of the Tensleep at 7117 feet. Perforations were made between 7060-

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7105 and 6686-6735 feet and the well flowed 418 barrels of 57-gravity distillate with 18,000 Mcf of gas per day against 44 pounds separator pressure. There have been shows in the other 2 Tensleep wells on this structure but no previous tests have been made. Initial production from the Tensleep on the discovery well, ½ mile south, was at the rate of 1800 barrels per day.

In the Beaver Creek gas field, 12 miles northwest of Sand Draw, Stanolind Oil & Gas Company has made location for its fifth well to the Lakota sands. The well will be a 1-mile north extension, if productive. Stanolind is now drilling its third well to Lakota below 9000 feet after testing a good show of gas with some distillate in the Frontier formation. Well 4 is drilling below 2000 feet.

Sweetwater County: Mountain Fuel Supply Company has completed an excellent gas producer in the Baxter Basin field near Rock Springs. The well is Hetzler 2, SE SE SE 6-18n-103w, Middle Baxter, which was first drilled to Tensleep at 5535 feet and then whipstocked near the surface and redrilled into the Frontier where the well was completed for 41 million cubic feet of gas per day through perforations between 2677-2712 feet. This gas is marketed by Mountain Fuel in the Salt Lake City area.

Colorado

At Iles Dome, Moffat County, Stanolind plugged back its Madison 1 test, NW SW SE 22-4n-92w, after testing sulphur water in the Madison formation. The well went to 7487 feet, total depth, and was plugged back to 4619 feet to make further tests of the Weber formation. When first drilled the Weber showed good saturation and porosity in the top of the sand, but made a large volume of sulphur water on drill-stem test between 4655-92 feet. Weber was topped at 4570 feet.

Montana

One of the most important tests in the Rocky Mountain area is about to be commenced by The Texas Company in the Bowdoin gas field, Phillips County. The well will be Government Unit 1-822, C SW SW 8-32n-32e, toward the west side of a group of 6 gas unit areas, and will be a test to granite. This area was unitized in 1942 for the shallow gas sands and Texas is the present operator of these units through a contract with Montana Dakota Utilities Company. There are approximately 210,000 acres in the defined area of the field, and an estimated 500,000 acres are leased by major companies in the area.

☆ Canada

Husky Has Drilling Program For Central Alberta Plains

Husky Refining Company of Cody, Wyo., is entering Western Canada with a program involving (1) installation of an asphalt plant at Lloydminster, establishing a new outlet for expanding production of 14-gravity crude from this Alberta-Saskatchewan border field; (2) acquisition of extensive oil and gas rights in semi-proven and wildcat areas on the Central Alberta Plains; (3) an active drilling program.

The company has signed production contracts with a number of Lloydminster well operators, and has posted a $25,000 bond requiring it to have a plant installed and in operation by the end of this year.

Scene of an active development program the past few months, the Lloydminster field delivered over 15,000 barrels net oil to the treating plant in July (taxing the plant to capacity), while at least 17,000 barrels had backed up in field tankage and pits by month's end, despite the fact some wells were shut in, and others operated only part time. Current indicated potential is about 40,000 barrels monthly, a figure which could apparently be substantially boosted in short order. Oil source is a Lower Cretaceous sand, found around 1900 feet. Wells are being drilled and cased in under a week. The entry of Husky, and the opening of a large new market, should stimulate development of the large area already proven, and encourage the search for new fields yielding heavy crude in the region.

McColl-Frontenac Oil Company and Union Oil Company of California, following up their 46 million cubic feet gas strike at the joint 9A-22-3-8, are drilling a new test 2¾ miles west of the discovery. Test is 4B-20-3-8, lsd 4 20-3-8w4th. The discovery is capped after yielding 46 million cubic feet daily from Bow Island sand at 2013-46 feet. With an eye on the future possibility of natural gas as a source of synthetic gasoline for Western Canadian needs, McColl-Union will seek to develop a major gas reserve in the Pinhorn area, on the southeast Alberta Plains.

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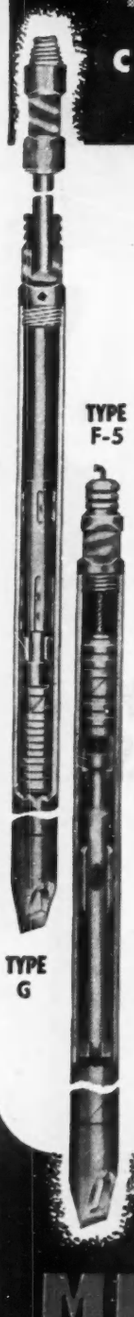

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EXPLORATORY COMPLETIONS

CALIFORNIA WILDCATS

Fresno County—Failure: Standard's Pauson 41-28e, Jacalitos area, Kreyenhagen 3963, Eocene 4140, Cretaceous 4965, abnd 5010.

Los Angeles County—Failure: Rothschild Oil Co.'s East Santa Fe Springs Community 1, 10-3s-11w, abnd 5788.

Ventura County—Failure: Rothschild Oil Co.'s Dempsey 1, 29-2n-21w, Camarillo-Oxnard area, abnd 3553.

FLORIDA WILDCAT

Dixie County — Failure: Stanolind Sun's Perpetual Forest 1, nw nw 5-11s-11e, abnd 7510.

ILLINOIS WILDCATS

Clinton County — Failure: E. J. Goldschmidt's Winkler 1, sw sw ne 24-1n-4w, abnd 1102.

Jefferson County—Failures: K. M. Bayer's Rainey 1, se ne sw 26-2s-2e, abnd 2845.

Collins Brothers' Guines-Glick 1, se sw sw 5-3s-4e, abnd 3169.

Madison County—Failure: J. McGovern et al's Bangert 1, w½ se ne 20-5n-8w, abnd 1225.

Marion County—Failures: G. J. McDeavitt's Ford 1, nw nw se 10-3n-3e, abnd 2489.

T. Blake Dirickson's Garrett 1, sw sw se 11-4n-2e, abnd 2231.

Richland County — Failure: Joe Young, Jr.'s Walker 1, sw nw ne 13-3n-11w, abnd 1904.

Wayne County—Failure: Brinkerhoff Drlg. Co.'s Clevenger 1, sw se ne 7-1s-9e, abnd 3340.

Washington County—Oil Discovery: Nat. Consumers Oil Co.'s Koelling-Pitchfort Community 1, nw sw se 10-2s-1w, pump 31 bbls fr Cypress sd, 1520-23, td 1532.

Washington County—Failure: Powell & Rae's Symon 1, se nw se 33-3s-1w, abnd 1353.

INDIANA WILDCATS

Gibson County—Failure: R. D. Brown's Powell 1, se se ne 12-2s-12w, abnd 2506.

Spencer County—Failure: I. C. Huff et al's Forsythe 1, 30-6s-4w, abnd 852.

KANSAS WILDCATS

Barber County—Oil Discovery: Skelly's Boggs 1-C, sw ne ne 17-33s-12w, flow 45 bbls fr Simpson sd 4824-42, td 4842.

Barber County—Failure: J. M. Huber et al's Smith 1, nw nw nw 7-32s-11w, abnd 4749.

Grant County—Failure: Stanolind's Meeker 1, 36-21s-37w, abnd 2865.

Harper County—Failure: Huber & Kraker et al's Misak 1, ne ne se 21-34s-5w, abnd 5310.

Kiowa County—Failure: Phillips' Nora 1, c sw nw 26-28s-17w, abnd 5202.

Norton County—Failure: Cities Service's Johnson 1-E, ne se ne 35-4s-23w, abnd 3765.

Ottawa County—Failure: Central States Oil Co.'s Central Life 1, c nw nw 34-12s-3w, abnd 3010.

Rice County—Failure: C. U. Bay's Myers 1, c w½ nw se 28-20s-9w, abnd 3300.

KENTUCKY WILDCATS

Crittenden County—Failure: J. L. Kennard's Thurman 1, 11-J-18, abnd 1008.

Daviess County—Failure: J. C. Ellis et al's Shipp Heirs 1, 12-P-28, abnd 1911.

Edmonson County—Failure: H. L. Cokes' Mitchell Heirs 1, 8-G-47, abnd 800.

Webster County—Failure: W. R. Dougherty et al's Chamberland 1, 1-M-25, abnd 740.

NORTH LOUISIANA WILDCATS

Caddo Parish—Failure: W. C. Feazel et al's S. L. Herold 1, c nw sw 21-15n-16w, Massive Anhydrite 4725-4980, Pettit 5845, Travis Peak 6213, abnd 6719.

Richland Parish—Failures: Roy Fisher-A. W. Hutchings' Tensas Delta Ld. Co. 1, c nw ne se 20-14n-6e, Gas Rock 3430, Tuscaloosa 4070, Basal Tuscaloosa 4850, L. Cretaceous 4881, abnd 5049.

Humphrey & Wynne's Mrs. M. D. Boughton 1, 2326 fr sl 1659 fr wl 1-15n-6e, abnd 3606.

Richland Parish—Gas Discovery: Kingwood Oil Co.'s Dr. T. M. Sayre 1, c se se sw 34-17n-7e, perf 2598-2600, flow 1,150,000 gas, ¼-in. td 3430.

SOUTH LOUISIANA NEW PAY TEST

Allen Parish—N. Elton Oil Discovery: Lloyd H. Smith's William Rees 1, 1652.7 s of nl 2339.2 w of el 23-6s-3w, e side of prod, perf 12 shots 6044½-46½, flow 18 bbls 48-gr oil, 6 bbls salt wtr, 1,320,000 gas 10/64-in, tp 2300 lbs. td 7615.

MICHIGAN WILDCATS

Allegan County—Failure: J. W. Lang Co.'s Lubbers 1, sw sw nw 9-4n-15w, abnd 1510.

Arenac County—Failure: American and Michigan's Durham 1, sw sw nw 19-19n-5e, abnd 3071.

Bay County—Failure: Richard Steinhorst's Bishop 1, se sw se 1-16n-4e, Dundee 2799, abnd 3790.

Kent County—Failure: Byron MacCallum's Stream 1, ne ne nw 20-10n-12w, abnd 2960.

Montcalm County—Failures: McClanahan Oil Co.'s Frost 1, se se nw 5-12n-8w, abnd 3600.

Stewart and White's Fee 1, ne sw ne 24-12n-6w, Dundee 3408, abnd 3433.

Osceola County—Failure: Sun's Wilcox 2, s½ ne nw 27-18n-8w, abnd 5292.

MISSISSIPPI WILDCAT

Madison County Failure: Salt Dome Oil Corp's E. S. Mansell 1, nw ne 25-11n-4e, Wilcox 1054, Eutaw 4615, abnd 4826.

MISSOURI WILDCAT

Clay County—Failure: Gray et al's Gaugh 1, 24-50n-32w, abnd 235.

MONTANA WILDCAT

Fergus County—Failure: R. C. Tarrant's Woodworth 1, se se sw 20-14n-24e, Button Butte area, abnd 3600, pb 2900.

NEBRASKA WILDCATS

Greely County—Failure: Ray Harrop et al's Juckiness 1, c sw¼ 12-19n-11e, abnd 150.

Holt County—Failure: Wynn & Shaver's Mallory 1, c n½ 32-33n-11w, abnd 905.

OHIO WILDCATS

Guernsey County—Failure: Ohio Fuel Co.'s R. K. Roahrig 1, sw nw 19, Wheeling Township, Oriskany 3040-50, abnd 3073.

Muskingum County—Gas Discovery: Ohio Fuel's Estella Buchanan 1, ne ne 15, Brush Creek Township, Clinton 3687-3735, 400,000 gas td 3738.

OKLAHOMA WILDCATS

Creek County—Failures: J. Garfield Buell's Donaldson 1-A, sw ne sw 4-14n-8e, abnd 255.

Gilespie & Sons' Gaasch 1, ne ne nw 22-14n-9e, abnd 3751.

Garvin County—Failure: Jordan Pet. Co.'s Carrol 1, sw se nw 36-2n-1w, abnd 5622.

Hughes County—Failure: Texas Co.'s Adams 1, nw nw sw 24-8n-9e, abnd 3686.

Kiowa County—Failure: J. P. Ledford's Evans 1, sw sw sw 8-7n-16w, abnd 2372.

Lincoln County—Oil Discovery: Danciger O&R Co.'s Pantlick 1, nw ne sw 15-12n-5e, flow 406 bbls fr Wilcox, 4536-44, td 4545.

Lincoln County—Gas Discovery: Wofford, Nicholson & Rose's Naylor 1, nw sw ne 7-15n-5e, flow 19 mln gas fr Prue sand 3557-72, td 3572.

Pontotoc County—Failure: V. L. Cromwell's Harris 1, nw ne ne 8-5n-6e, abnd 2251.

Seminole County—Failure: F. P. Haddock et al's Harrison 1, se nw nw 19-7n-6e, abnd 4401.

Seminole County—Oil Discovery: Gulf's Remaklus 1, sw sw nw 17-10n-7e, flow 1101 bbls fr Gilcrease sd 3725-80, td 3840.

WEST TEXAS WILDCATS

Crockett County—Failure: Moore Exploration Co.'s Halff 3-C, 515 snl 4895 wel I&GN Ry. 69, blk 1, elev 2375, abnd 3372.

Crockett County — Oil Discovery: Moore Exploration Co.-Stanolind-Magnolia's Halff-Bivins 1, 660 out swc I&GN Ry. 65, blk 1, elev 2175, Yates 610, Grayburg 1415, San Andres 1510, Clear Fork 2870, Pennsylvanian 5620, Simpson 6730, Waddell 7140, Ellenburger 7222, pump 3½ bbls oil, 45% wr, acidized Glorietta (Holt) perf 2692-2710, td 7512, pb 2790.

Tom Green County—Failure: Dave Bennett-J. W. Sorrells' Sanders 1, 330 out nwc sect 186, Washington County Ry. Co. sur, elev 2047, Clear Fork 670, Wolfcamp 2690, Canyon 4373, Strawn 5570, Mississippi 6300, Crinoidal 6415, Ellenburger 6635, abnd 6751.

WEST CENTRAL TEXAS WILDCATS

Coleman County—Gas Discovery: Brannon & Murray (was H. O. Newman and B. H. Nolan's) John R. Pearce 1, 990 snl 330 wel Labor, lge 57, Coleman CSL sur, 3 mln gas, lime 2002-07, td 2127.

Fisher County—Huddleston Oil Discovery: Skelly's Huddleston 1-A, 2815 snl 1675 ewl T&P Ry. 11, blk 9, elev 1854, base Sedwick 2435, Dothan 2495, Noodle Creek 2583, Saddle Creek 2815, Flippen 2870, Swastika 3292, Palo Pinto 4371, flow 805 bbls 45-gr, gor 871/1, via 2-in fr sandy-lime pay 4309-4405.

Menard County—Oil Discovery: Warren Pet. Corp.-T. F. Morrow's Russell 1, c ne ne sect 18, S. Wallick sur, elev 2165, Cisco 970, pump 21 bbls 32.5-gr fr Canyon sd 2282-90, td 2307.

Nolan County—Oil Discovery: Sohio's Faver 1, c nw nw T&P Ry. 50, blk 21, elev 2125, Valera 2260, Hope 2678, base Dothan 3120, base Saddle Creek 3330, Strawn 5662, pump 8 bbls 42.7-gr oil, 8 bbls wr fr sd 5671-82, td 5836.

Runnels County—Failure: O. P. Leonard et al's Trammell 1, 467 snl 1401 ewl E. T. Ry. 115, elev 1869, abnd 3600.

WEST CENTRAL TEXAS NEW PAY TEST

Palo Pinto County—Oil Discovery in Gas Field: Palo Pinto O&G Co.'s Wesley Roberson 1, 660 ewl 3770 snl T&P Ry. 53, blk 2, near gassers, flow 30 bbls oil, 2-in, fr Marble Falls sd 3877-86.

EAST TEXAS WILDCATS

Cherokee County—Oil Discovery: Watson W. Wise-Delta Dr. Co.'s J. O. Huggins 1, 330 nsl 960 wel of 117-ac tr, 5600 wel 330 nsl of Levi Jordan sur, elev 388, Nacatoch 3625, Pecan 4023, Austin 4898-5110, flow 90 bbls 41.8-gr, gor 250/1, natural via ¼-in, tp 450 lbs, cp 900 lbs, Woodbine sand 5111-16.

Cherokee County — Failure: Tex Harvey Oil Co.'s Reitsch 1, 330 nsl 2910 wel of 200-ac tr and O. Weir Sur, Midway 1877, Navarro 2983, Pecan 3320, Austin 4140-4333, Woodbine series 4333, sand 4340, abnd 4423.

EAST TEXAS NEW PAY TESTS

Wood County—Manziel Oil Discoveries: Rogers Lacy-R. J. Caraway's Shamburger 1-A, 330 out swc of 67½-ac tr, 330 ewl 2300 nsl Jas. Moore sur, elev 472, Austin 3972-4062, Sub-Clarksville sd 4148-54, 4157-65, Woodbine 4524, Georgetown 5218, Paluxy 6380, pump 113 bbls 16.2-gr oil, 1% sw, Sub-Clarksville perf 4146-66, td 6413, pb 4270.

Magnolia's Malone-Taylor Unit 2, 330 ewl 467 snl of J. C. Taylor 50½-ac tr, John Polk sur, elev 471, Woodbine 4500, Georgetown 5134, Paluxy 6334, pump 261 bbls 26-gr oil, 65 bbls mud and wr fr Dexter (Woodbine) sd perf 4784-90, td 6585, pb 4785.

EAST TEXAS BORDER COUNTIES WILDCATS

Angelina County—Failure: Tex-Mo Drlg. Co.'s Long Bell Pet. Co. 1, 330 fr wl 1950 n of swc HT&BRR sur, 3 mi ne Zavalla, abnd 3001.

Harrison County—Failure: Rogers Lacy's E. Key 1, 2300 fr m/nly/nwl 6450 fr el A. Crocker sur, 14½ mi s Marshall, abnd 6625.

SOUTH CENTRAL TEXAS WILDCATS

Bastrop County—Failure: J. C. Tittle's Martin McDonald 1, 330 fr el 1025 s of nel 152.4-ac lse, Martha Barker sur, abnd 803.

Milam County—Failure: W. L. Glen's A. R. O'Neal 1, 1400 fr nl 990 fr wl 270-ac lse, Jose Leal sur, 2½ mi e of Minerva fld, Austin Chalk 3200, Georgetown Lime 3925, Edwards Lime 4090, abnd 4121.

SOUTHWEST TEXAS WILDCATS

Duval County—Gas Discovery: H. H. Howell's Lizzie Singer 3, 330 fr el 1570 fr nl G. Cumberland sur 4, 330 fr el 3035 fr nl 785-ac lse, Palangana Dome, pay 1683, perf 1683-1705, flow 50 mln dry gas open, sip 730 lbs, td 1725.

Duval County—Failure: Humble's Dallas Jt. Stk. Ld. Bnk. 1-D, 2196 fr nel 1751 fr nwl Eliz. Gravis sur 504, on 11,746-ac "D" lse, sw Hoffman fld, abnd 3072.

McMullen County—Failure: Joe C. Palmer's Cooper & Martin 1, 330 fr n&el s½ sect 6 Hagist Rch, on 80-ac lse, ETRR sur, 4½ sw Loma Alta-Wilcox fld, abnd 3071.

SOUTHWEST TEXAS OUTPOST

Duval County—Conoco Driscoll Failure: Continental's Robert Driscoll Est. 90-A, 2300 fr el 2500 sl sect 49, Santa Rosalia gr, 12,000-ac lse, n of oil prod, 4300 ne Driscoll 80-A gas well, abnd 3664.

SOUTHWEST TEXAS NEW PAY TEST

Starr County—Kelsey S. Flk. Oil Discovery: J. O. Clark, Jr.'s Gonzales Unit 2-A, 800 fr wl 1400 fr nl 158.56-ac lse, tr 3-A, Santa Teresa gr, 960 s sw Gonzales 1-A, s extension in shallow pay, pay 5706, perf 48 shots 5709-18, flow 149.45 bbls 42.8-gr, 5/32-in, gor 603/1, td 5739.

LOWER TEXAS COAST WILDCATS

Brooks County—Failure: Humble's W. P. Gardner-State 1, 1980 fr nl 660 fr el J. F. Dawson sur 348 on 598-ac lse, 12 mi se Falfurrias, 1 mi w Mariposa fld, abnd 10,991.

Jackson County — Failure: Renwar Oil Corp.'s H. E. Mercer 1, 467 e alg sl fr swc Renwar's 18.8-ac lse, H. O. Taylor lse th 467 s at ra to lcn 3 mi s Ganado, on 196.4-ac lse, Wm. Menefee sur, abnd 4997.

LOWER TEXAS COAST NEW PAY TEST

Nueces County—N. Minnie Bock Oil Discovery: Atlantic's Geo. Renker 1, 660 fr el 1980 fr sl sect 45, Geo. H. Paul sbdn Robert Driscoll Rch, on 120-ac lse, M. L. de Herrera gr, pay 7870, perf 24 shots 7877-81, flow 185-29 bbls 29-.2-gr, ⅛- and 9/64-in chokes, gor 676/1, tp 660 lbs, td 9431.

UPPER TEXAS COAST WILDCATS

Chambers County—Failure: Jack W. Frazier's E. A. Wilborn Est. 2, start at ely/e/cor Wm. Ritchie sur go 308 nw alg nel th 660 ne at ra in T&NO sur, abnd 10,019.

Hardin County—Failure: Houston Oil Co. of Tex.'s Houston & American Republics Fee 1, 4723 fr sl 371 fr el Thos Penny sur, 18,350 w sw nearest Village Mills prod, abnd 11,000.

Harris County—Failures: Jack W. Frazier-Dick Schwab's August Fuchs 1, 466 fr s&wl 53-ac lse, BBB&C sur, 2 mi s Fairbanks fld, abnd 7902.

Humble's Mora C. Kramer et al 1, 660 fr nl 2495 fr wl sect 36 H&TC sur, blk 2, 640-ac lse, 2½ mi s of N. Delhi disc well, abnd 7513.

Matagorda County—Oil Discovery: Magnolia's Live Oak Farms 1, 660 fr s&wl lot 9 2000 w 1950 n of sect J. W. E. Wallace sur, 1 mi w El Maton, 5 mi e Midfields fld, pay 8450, perf 25 shots 8450-56, flow 160.1 bbls 41-gr oil, ⅛-in, gor 744/1, tp 1300 lbs, td 8468.

Wharton County — Failure: Albert G. Blanke, Jr.'s Louise Hutchins & Hallie Pearson 1, 330 fr s&el 426.76-ac tr, HE&WT sur, abnd 5375.

UPPER TEXAS COAST NEW PAY TEST

Hardin County—Saratoga NE Flk Oil Discovery: L. M. Josey et al's Caswell tr 3, 330 fr nl 587.5 n&e of Well 2, pay 5690, perf 280 shots 5698-5768, flow 162.6 bbls 39.9-gr, 0.1% wtr, 9/64-in, gor 495/1, tp 800 lbs, cp 1000 lbs, td 5970.

WYOMING WILDCAT

Fremont County—Failure: Fuerst Oil Co.'s Cooley 1, sw se se 29-33n-100w, Squaw Creek area, abnd 1201.

WILDCAT STARTS

CALIFORNIA

Kern County: S. R. DeKalb's Blake 14, 25-25s-18e, Devils Den area, dr.

Rothschild Oil Co.'s Alma 1, 15-28s-28e, Round Mountain area, lcn.

Texas Co.'s West Pet. 1, 29-30s-22e, McKittrick area, grade.

Tide Water's Midway McKittrick 5, 32-30s-22e, McKittrick area, grading.

Kings County: Guy Richardson's Holtz & Zanetti 1, 8-24s-18e, Pyramid Hills area, dr.

Los Angeles County: Amapola Corp.'s Amapola 1, 6-6n-12w, Antelope Valley area, lcn.

Ventura County: Los Nietos Co.'s C. & H. 2, 23-3n-12w, W. Mt. area, grade.

KANSAS

Butler County: E. H. Adair's Truman 1, nw se 10-18s-10w, rur.

Dave Alter & Brackenseik's Swindel 1, ne ne nw 22-28s-3e, rum.

Ellis County: Tom Allan's Pfiefer 1, sw sw se 34-13s-19w, sur hole.

Sohio et al's Herman 1, se se nw 3-14-16w, lcn.

Graham County: Cities Service's Rome 1, se sw sw 27-9s-25w, drlg.

McPherson County: Sharon & El Dorado's Young 1, se se ne 11-18s-1w, lcn.

Ottawa County: H. B. Peatling's Quinn 1, se se se 27-11s-2w, drlg.

Pratt County: Bridgeport Oil Co.'s Price 1, ne ne ne 24-29s-13w, sur hole.

Rice County: Phil-Han's Shonyo 1, nw nw se 10-18s-10w, rur.

Stafford County: Plains Exploration Co.'s McCune 1, se se sw 33-24s-12w, rur.

Woodson County: R. L. Brineager et al's Bauersfeldt 1, sw ne sw 35-25s-14e, drlg.

NORTH LOUISIANA

Franklin Parish: Atlas O&R Co.'s Ayer Timber Co. 1, sw nw 26-14n-9e, 5000-ft test.

Richland Parish: Roy L. Fisher et al's Douglas Robinson 1, c se ne se 13-17n-7e, lcn.

SOUTH LOUISIANA

Cameron Parish: W. T. Burton's Lake State 1, 12,577 w 8456 n of nec 1-14s-9w, Calcasieu Lake, lcn.

St. Mary Parish: Humble's Hunible-Cote Blanche 1, fr USCGS "Cote Blanche," Lat 29° 44 min 56.965 sec and Long 91° 42 mins 58.316 sec, go n 36° 28 mins w 6010 to lcn in undetermined Sect-15s-7e, 13,000-ft test.

Terrebonne Parish: Joe W. Brown's Lyons 1, s 41° 11 mins w 1491.4 to lcn fr nec sect 38 lot 5, 38-18s-18e, 10,000-ft test.

MICHIGAN

Allegan County: J. W. Lang Co.'s Henderson 1, sw sw nw 28-3n-13w, dr.

Arenac County: Don F. Rayburn's Swinecki 1, nw nw ne 28-20n-3e, rig.

Iosco County: Gulf's Beardslee 1, sw nw se 4-21n-5e, rig.

Isabella County: H. Eddie Bell's Bates 1, sw nw sw 12-13n-3w, dr.

Osceola County: Sun's Salisbury 1, c sw 10-20n-7w, rig.

Ottawa County: H. J. Hirzel's Geukes 1,

"Red Wheel"

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CHECK VALVE

GATE VALVE

M & H valves are used in the oil industry for water, gas, steam, oil, chemicals and are furnished in all commercial sizes from 2" to 30", inclusive. They are cast iron body, bronze mounted, furnished double disc parallel seat or solid wedge. They are heavily proportioned and have a high factor of safety.

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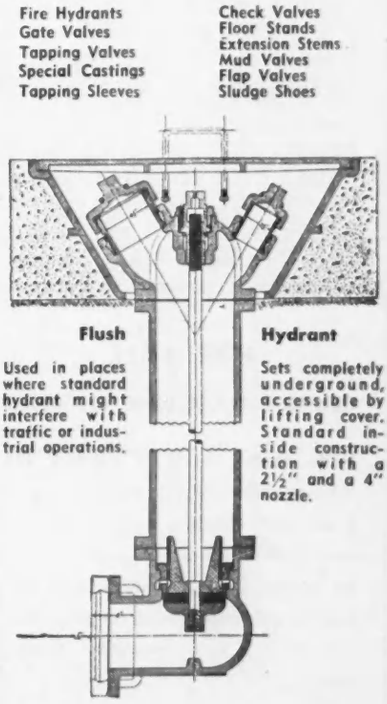

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Used in places where standard hydrant might interfere with traffic or industrial operations.

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Sets completely underground, accessible by lifting cover. Standard inside construction with a 2½" and a 4" nozzle.

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■ 5 Complete Reda Pumping Units. Cables like new. 75 and 97 H.P. Motors. Max Steinbuchel, 1905 Park Place, Wichita 4, Kansas. Phone 5-6082.

■ FOR SALE—831'2" of new A.P.I. casing, 11¾" O.D. 47# seamless steel, Grade J-55, Short T & C, 8 round thread. 34 Pieces 771 Ft. of Range 1, 2 Pieces 60'2" Range 2. Pittsburgh Plate Glass Company, New Martinsville, West Virginia. Purchasing Agent.

■ 1 Mac BX Tandem truck with Oil Field Bed & Tulsa Winch, in good condition. Suitable for mounting oil field rig. U. S. Truck Line, Woodcrest 6-8808.

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50— 500 Barrels
10— 1,000 Barrels
20— 5,000 Barrels
4—10,000 Barrels

Heavy A.P.I. New closed bolted type steel tanks now located at Ogden, Utah. Can quote reasonable prices in order to move from present premises at once.

JOS. GREENSPON'S SONS PIPE CORP.
National Stock Yards, St. Clair County, Ill.

BRAND NEW DRILL PIPE OUT OF STOCK PRICE

367 Jts. 4½ A.P.I. Full Hole Hinderliter Welded Joints 5¾" O.D. 8000' National Seamless Pipe—Balance J&L Blue Ribbon —All 16.60 lb. Grade E Range 2 Internal Upset Pipe A.P.I.
398 Jts. 3½ Hughes Flash Weld Grade D External Upset Internal Flush Type "C 3.8" 5" O.D. 2-11/16" I.D. Joints Pittsburgh Seamless 13.30 lb. pipe.

USED DRILL PIPE

34,000 ft. 3½" A.P.I. Full Hole-Modified-Hydrill-Acme Regular 11,000 ft. 4½" Hughes Extra Full Hole, 5¾" O.D. approximately.

PRICED TO SELL — ALL PIPE SUBJECTED TO PRIOR SALE

M. A. TAYLOR
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NEW—Model V-425, 12 cylinder 425 H.P. at 1200 R.P.M., gasoline engine power unit complete radiator to twin disc clutch inclusive with gasoline starting engine. Cheaply convertible to natural gas operation. Priced far below factory list, 7 units available. Dealers invited.

THE FINN EQUIPMENT CO.
2525 Duck Creek Road, Cincinnati 8, Ohio
Phone East 1125

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■ FOR SALE—Slim-hole drilling rig, 1-yr. old, recently overhauled; capable of drilling stratographic and exploration holes to 4,000 feet or more, complete with all tools and equipment, including 2 strings of drill pipe (1 new); dog house, two-wheel drive trucks and semi-trailer for hauling equipment. Rig mounted on special semi-trailer. One of the slickest and most economically operated drilling rigs in the business. Cost $56,000. Will sell for $33,500. Call D. W. Varel, T 3-9911 or write P. O. Box 1678, Dallas.

■ Two stage Gardner-Rix Air Compressor, vertical type, size 4½" x 2½" x 4½", Displacement 21 CFM, Max. Pressure 600 p.s.i., mounted on steel base and powered with 6 HP F&M Gaso Engine. Excellent condition. Price $450.00. R. W. Stewart, 613 No. Seminole, Okmulgee, Oklahoma.

■ FOR SALE—2 model 300 IHC "OIL FIELD" Engines complete, less starter & battery, located at Tulsa. Riverland Company, McBirney Building, Tulsa, Phone 8490.

■ FOR SALE—3 Model 71A Star Spudders with 40' telescoping mast, drilling tools, and accessory equipment, each mounted on 1942 1½ T Ford Truck. Also, 1 Model "1500" Failing Hole-Master Drill with 4½ x 6 GD Pump, automatic pul-down and approximately 370' drill rod, mounted on 1942 1½ T Ford Truck with Fabco tandem drive and 11 - 8:25 x 20 tires. All units excellent condition. For further details write Box 59, The Oil Weekly, Tulsa, Oklahoma.

FOR SALE

1—Model H Ft. Worth Spudder with power and tools.
1—Model D Ft. Worth Spudder with power & tools and lines.
1—Model D Ft. Worth Spudder without power or tools.

L. A. WARREN DRILLING CO.
Laguna Hotel Bldg., Cisco, Texas.
Phone 609

FOR SALE

FAILING "1500" HOLEMASTER CORE DRILL

With special 40 foot mast mounted on 1942 Ford 1½ ton truck with extra motor on pump and Kohler light plant. Together with 1½ ton 1942 Chevrolet water truck equipped with Tulsa winch. 400 gallon water tank and pump. Hobbs pipe trailer drill pipe, rock bits, fish tail bits, acetylene welding unit, steel dog house and miscellaneous tools all in good condition and ready to go. Must be seen to be appreciated.

Merry Brothers at Demopolis, Alabama

FOR RENT

POWER PUMP

New 5 x FXO Gardner Denver powered with new Waku Motor

JACK KNIFE DERRICK

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FOR RENT

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Box 814 Houston Fairfax 9339

HELP WANTED

■ Substantial independent oil company, Fort Worth, has permanent position open for employee, male or female, with minimum five years experienne in payment and handling oil lease rentals and records. Must be expert typist, stenographer preferred. State experience, references, minimum salary expected. P. O. Box 670, Fort Worth, Texas.

■ DESIGN ENGINEER—Experienced on Rotary Oil Well Drilling Equipment. To be located in the Southwest. Application should give age, education, experience, and salary expected. Write Box 56, The Oil Weekly, Houston, Texas.

■ GASOLINE PLANT—The Accounting Department of a major oil company can offer an exceptional opportunity to an experienced man thoroughly familiar with all phases of gas measurement and of gasoline plant operation and who has knowledge of accounting principles. Give full information in first letter. Box 57, c/o The Oil Weekly, Houston, Texas

■ DESIGN ENGINEER desired by leading oil field equipment manufacturer. Need mechanical engineering background and experience. Knowledge of oil field equipment desirable. Permanent position with opportunity for advancement. Other positions open in engineering department. Our employees know of this ad. Give background and experience first letter. Write Box 50, The Oil Weekly, Houston, Texas.

MICRO-PALEONTOLOGIST
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Assists chief paleontologist in making stratigraphic correlation of well and surface samples by micro-paleontology. At least 3 to 4 years' experience. Degree. Write to:

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The Boston office of E. B. Badger and Sons Co., internationally famous chemical engineering organization, offers qualified men well-paying positions. This is a fine opportunity for men who would enjoy working in congenial surroundings and with pleasant cooperative associates. A personal interview can be arranged in your city. This is not a temporary position. Write, giving full details of background and experience, salary wanted, etc., to

Mr. William M. Rose, Personnel Director
E. B. Badger and Sons Co.
75 Pitts Street, Boston, Mass.

SITUATION WANTED

■ WANTED—To learn the gravimeter business in Rocky Mts. and Southwest. In exchange can offer ten years geological and engineering experience, last three years surface and sub-surface work in Rocky Mts. area with supervisor responsibilities. Box 55, c/o Oil Weekly, Houston, Texas.

SITUATION WANTED

■ GEOPHYSICIST DESIRES CHANGE, age 36, degree Mathematics and Geology, 12 years experience, 2 computing, 6 Party Chief and 4 Supervising and directing chiefly Texas, Louisiana and Mississippi. For further particulars and references write Box 58, c/o Oil Weekly, Houston, Texas.

WANTED TO BUY

■ Wanted at once for cash, large spudder with tools. Write or wire Ringle Drilling Co., 3433 Purdue Pl., Albuquerque, N. M.

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Trading Post Section

Regular classified advertisements for this special section, set in type this size without border, takes flat-rate of 7 cents per word for the first insertion and 5 cents per word for each subsequent insertion of same copy. Display advertisements for this section, set in suitably larger type with ruled border, are $5.00 per inch for the first insertion and $4.00 per inch for subsequent insertions. Remittance must accompany copy which should be sent to:

Trading Post Section, The Oil Weekly
P. O. Box 2608 Houston 1, Texas

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for

Alabama-Mississippi and Florida-Georgia

Available for Immediate Shipment from Stock

Form 311-A.M.—Designed for use in Alabama and Mississippi

Form 311-F.G.—Designed for Use in Florida and Georgia.

Order by Form Number

Both of these forms were prepared by leading oil attorneys and lease men and are in use by both majors and independents.

Write, Wire or Call Your Order to

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sw sw se 12-5n-13w, rig.

Clawson Development Co.'s Blauwkamp 1, c se se 2-5n-14w, lcn.

Saginaw County: Fred W. Craft's Willie 1, nw nw ne 28-20n-3e, rig.

MISSISSIPPI

Issaquena County: Burns & Miller's J. C. Mahannah 1, ne nw 11-18n-3e, lcn.

Yazoo County: Stanolind's Mrs. Cornelia Heagman 1, nec 9-11n-5w, drlg.

MISSOURI

Gentry County: Dan Short's Howatt 1, sw se ne 9-61n-32w, lcn.

MONTANA

Phillips County: Texas Co.'s Unit No. 1-822, c sw sw 8-32n-32e, Bowdoin field deep test.

NEBRASKA

Harlan County: C. L. Turner's Lewis 1, se se ne 30-1n-18e, drlg.

NEW MEXICO

Curry County: Humble's Northcut 1, c se sw 32-8n-37e, nec of county, mim 6500-ft Ellenburger test.

San Miguel County: Phillips' Leatherwood 1, nw ne sw 2-15n-18e, 15 mi se Las Vegas, spud, deep test.

OHIO

Coshocton County: Benedum-Trees' John W. Lee 1, nw sw 16, Bedford Township, drlg.

OKLAHOMA

Cotton County: E. W. Whitaker's Graham 1, sw se se 5-4-s-11w, drlg.

Burk Royalty Co.'s Warren 1, sw sw nw 3-5s-10w, drlg.

Jackson County: Jackson & Davenport's Dobbs 1, ne ne se 7-1n-19w, drlg.

McClain County: Mid-Continent Pet. Corp.'s Kirkland 1, sw se nw 26-5n-2w, lcn.

Okfuskee County: Olson Drlg. Co.'s Oliver 1, se se ne 13-12n-7e, drlg.

Okmulgee County: Liberty Glass Co.'s Sitler 1, nw se sw 3-15-12e, mist.

Pottawatomie County: E. N. Jordan's Graham 1, se se se 22-6n-4e, lcn.

Seminole County: Ilco Corp.'s McIntosh 1, sw ne se 3-9n-7e, lcn.

Gulf's Larney 1, se ne ne 31-10n-7e, lcn.

WEST TEXAS

Garza County: Herman & Geo. R. Brown-Comanche Corp.'s Post Est. 1-A, 2310 snl 2190 ewl of ne¼ sect 1228, 1 mi n by e outpost to Post fld, 3150-ft test.

WEST CENTRAL TEXAS

Callahan County: R. Kamon et al's Kennard 1, se se sw sec 26, E. T. Ry. sur, lcn.

H. A. Stebbinger et al's Kennard 2, ne ne ne sec 9, E. T. Ry sur, 2000-ft rotary test.

Concho County: Richards-Patton & Greer's Frank Smith 1, ne ne nw sect 609, German Emigration Co. sur, 4200 ft cable test.

Coleman County: L. L. Horne et al's J. F. McCord 1, 4050 snl 1920 ewl sect 16, J. H. Gibson sur, 4000-ft rotary test.

Jones County: W. W. Harvey et al's W. N. Wofford 1, 1990 out sec T&P Ry. 22, blk 14, 1800-ft cable test.

George Waite et al's H. V. Burgeson 1, ne ne sw sec 26; HT&B Ry.-A. D. Norcop sur, 2100-ft cable test.

Taylor County: Hedrick Oil Co.'s Teaff 1, 330 out nwc Labor 14, lge 124, Grimes CSL sur, 2750-ft rotary test.

EAST TEXAS

Bowie County: Delta Drlg. Co.-Phillips et al's J. N. Gauntt 1, 335 snl 919 fr m/e/el of 71-ac lse, 1320 snl 1720 ewl James Giles sur, Navarro 850, Nacatoch 1060 Saratoga 1600, dr 2500.

Upshur County: Bobby Manziel et al's et al's Judy Brown 1, 2700 sw of m/s/nl 2300 w of river, 330 out sec 40-ac lse, (south) Henry A. Augustine sur, 4 mi w Gladewater, credited with 5 ft oil sand in Woodbine, td 4100 feet in Georgetown.

NORTH TEXAS

Archer County: D. L. Wolf et al's J. M. Black 1, 270 nsl 196 ewl of e 40-ac of s 100-ac of tr, 2400 ewl 3150 snl Allison Arms sur, 1400-ft rotary test.

Baylor County: W. F. Palmer et al's T. J. Jordan 1, 1650 snl 180 m/w/el of T&NO Ry. 150, 1400-ft rotary test, dr 1310.

Cooke County: Burk Royalty Co.'s C. N. Bentley 1, 1000 s 1100 e of sec of S. D. Brown sur, but in A. C. C. Bailey sur, 2400-ft test, dr 300.

Frederick Electric Co.'s L. B. Holland 1, 2007 snl 150 ewl A. Houston sur, 1200-ft test.

Grayson County: Humble's J. E. Fallon 1, 143 snl 660 ewl W. H. Trellinger sur, 3 mi n by w Gunter, 7000-ft Ellenburger test, dr 735.

Jack County: Continental's Tom Cherryhomes 1-C, 1263 w 330 s of m/e/nec of Florida Payne sur, slim-hole test, testing at 5626.

Young County: L. T. Burns et al's E. J. Ernest 1, 450 ewl 2083 snl sect 64, TE&L Co. sur, 1150-ft rotary test

SOUTH CENTRAL TEXAS

Uvalde County: Bennett & Sorrells' Mary Rehm 2-1, 330 fr sl Wm. H. Butler sur 308, 330 fr el G. R. Patterson sur 833, 330 fr n&wl 80-ac lse, Peter Fricker sur 807½, 4500-ft test.

SOUTHWEST TEXAS

Duval County: Continental's Clara Driscoll A Lse 1, 2300 fr sl 2300 fr el sect 48, sbdn Sta. Rosalia gr, 2240-ac "A" lse, n exten test at Conoco-Driscoll fld, 3500-ft test.

Humble's Dallas Jt. Stk. Ld. Bnk. 1-E, 330 fr s&wl 1120-ac "E" lse, BS&F sur 195, 1 mi se E. Peters fld, 3000-ft test, drlg 155.

Webb County: Dualney Oil Co.'s Frost Nat. Bank 1, 2661 fr sl 2741 fr wl 640-ac lse, in sur 603, 2000-ft test.

LOWER TEXAS COAST

Hidalgo County: T. F. Murchison's C. O. Maddox 1, 467 w of el Porc 46, 430 e of Rio Grande River, 500-ac lse, 6000-ft test.

Live Oak County: Stanolind's Pearl Harris 1, 660 fr se&swl 521-ac lse, sw end of Francisco Leal sur, 8500-ft test.

Nueces County: Brown & Wheeler's Lamar Folda, 660 fr nel 660 fr sel blk 4, Wm. J. Robertson Farm Trs, 75-ac lse, out of blks 4&10, Enrique Villareal gr, 9000-ft test.

San Patricio County: H. R. Smith-Dan Auld's Sevier 1, c nw¼ ne¼ sect 6, Taft farmlands, G. T. Tabor sur, e flk shallow Taft fld, bldg dk and mi for 9000-ft test.

UPPER TEXAS COAST

Chambers County: J. E. Jackson 3, 1320 fr el 1975.6 fr sl 550-ac lse, J. S. Roberts, sur, bldg rds to lcn 8300-ft test.

Gulf's W. F. Mayes et al 2, 192.7 fr el 1980 fr wl 365 fr sl 278-ac tr in 8066.36-ac lse, Victor Blanche sur, 8100 n of Mecom's Mayes 7, nearest prod on Lost Lke Dome, 12,000-ft test.

Colorado County: Tide Water's Gust Goeckler 1, 2254 fr sel 467 fr swl 273.22-ac tr, W. D. Ramsey sur, 4000 sw of Cities Service's Stephens 1, gas-cond at Ramsey, 11,000-ft test.

Harris County: Jack W. Frazier-Dick Schwab's L. H. Caesar 1, 466 fr s&el 40-ac lse, Samuel Lewis sur, E. Fairbanks area, ru 8500-ft test.

Liberty County: L. D. Cartwright's B. E. Quinn 1-A, A. B. Rozell sur, 3½ mi n nw McCoy fld area, 160 out of nec s½ 500-ac lse out of 580-ac tr, 9000-ft test.

Grubb & Hawkins' E. B. Pickett, Jr. et al 1, 660 fr n&el 404.5-ac lse, 2640 fr nl 660 fr el T&NO sur sect 14, 2 mi e ne Cotton Wood disc well, 8400-ft test.

Montgomery County: Humble's E. L. Bender 3, 467 s of sl Degnan 50-ac lse, 1689 e of m/sly/wl 5000-ac lse, Montgomery CSL sur 2, 3 mi ne Spring, 6500-ft test.

Wm. S. Thompson's Sam L. Olson 1, 466 fr sl 1400 fr wl 270-ac tr and F. A. B. Wheeler sur 4000-ft test.

WYOMING

Big Horn County: Cities Service's Gov't. 1, se ne ne 13-51n-93w, Lamb area, lcn.

Fremont County: Stanolind O&G's Unit 5, c sw se 34-34n-96w, Beaver Creek, 1 mi n ext.

California Survey Reveals Current Production Wages

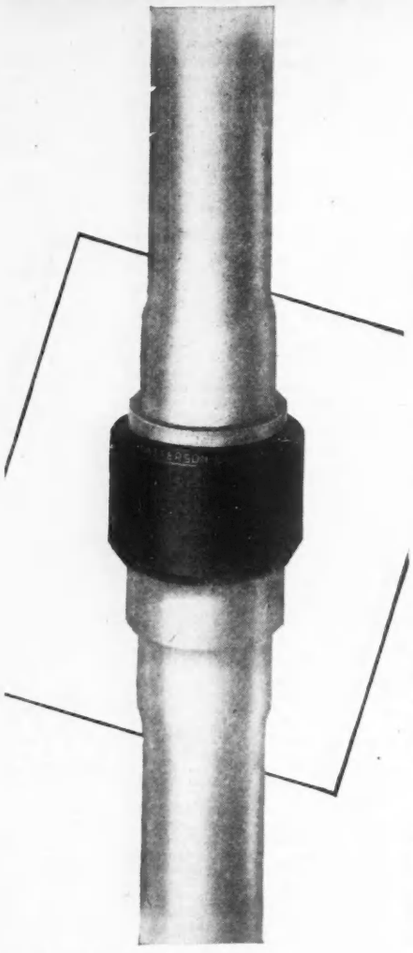
Current wages in the production division of the California oil industry average $1.38 per hour, a 34.51 percent increase over the average of $1.02 per hour on January 1, 1941, figures from a survey by the Oil Producers Agency show.

Thirty-three job classifications are listed in the Agency questionnaire, all of them in the drilling and producing branches of the industry. The replies show that, since January 1, 1941, the major companies have put an average increase of 38.15 percent into effect, the principal minors (producers of 45,000 barrels or more per month), an average increase of 33.65 percent, and independents an average increase of 33.67 percent.

These averages do not reflect overtime earnings, which in general begin after an 8-hour day or a 40-hour week, or shift differentials paid for work between 4 p.m. and 8 a.m.

The average hourly rates paid by the three groups are: $1.40, principal minors; $1.38, major companies; $1.32, independents. These figures compare with $1.05, $1.00, and 99 cents, respectively, at January 1, 1941.

"Best Bet Yet"



Cut Metal-to-Metal Contact

These oil-proof, insulating, wear-resistant, plastic tubing protectors are an integral part of the tubing collar. Made in all sizes, they prevent the metal-to-metal contact that causes many expensive "wet" jobs in pumping wells. Without this contact, the collars do not wear holes in the casing.

See Composite Catalog

Patterson-Ballagh TUBING PROTECTOR

LOS ANGELES HOUSTON 10 NEW YORK 6

SQUEAKS from the BULL WHEEL

This Curious World

Said a wise old bat of a crazy young bat: "He must have people in his belfry."

When you argue with a fool, be sure he isn't similarly engaged.

The longest word in the English language is the one you hear on the radio after this: "And now a word from our sponsor . . ."

If your wife is out of town and you want her to hurry back, just send her a copy of the local paper with an item on the front page clipped out.

If you don't get everything you want, console yourself by thinking of the things that you don't get that you don't want.

"Lady," said the salesman in the hat store, "this number will never go out of style. It will look just as ridiculous ten years from now."

Nothing makes a woman so furious as to have a guest drop in unexpectedly and find the house looking like it usually does.

Many a guy who isn't an engineer has started a girl off on the wrong track.

Overheard in the park: "Hands off, Columbus. You've discovered enough for one night!"

If the Texas drouth doesn't hurry up and end, the trees will be chasing the dogs.

Life Is Like This

"I want to buy a nice book for my sick husband."

"Something of a religious nature, Madam?"

"No. The doctor told him he will live."

Poet's Nook

Men don't wear glasses
With girls who make passes.

Loosely Speaking

A Negro G.I. was having an important interview with the separation officer. "Before you can leave this man's army I must ask you one very important question. How many dependents do you have?"

"I ain't got no dependents at all."

"Why it says right here on your papers you have a wife."

"Oh, yas sir, I saw it too. But I found out she ain't dependable."

Valuable Subscriber

The above story reminds us of the Scotsman who wrote the editor of a magazine that if he didn't stop running stories about Scotsmen that he would quit borrowing the magazine.

The Sad Truth

"Doc, how come you always order a fellow to quit eating the things he likes?"

"Because he never eats or drinks the things he doesn't like, so it stands to reason it must be the things he does like that are disagreeing with him."

Wide of the Mark

"Did you say your girl's legs are without equal?"

"No, I said they were without parallel."

That Does It

A Scotsman leaned against a bar holding his stomach and moaning piteously.

"Sick?" asked a sympathetic stranger.

"Vurra sick. I'm afraid I've got yoors."

"What's yoors?"

The Scot immediately brightened. "Make it scotch and soda."

Soup's On

"Shall I boil the missionary?" asked the cannibal cook.

"Don't be silly. That's a friar."

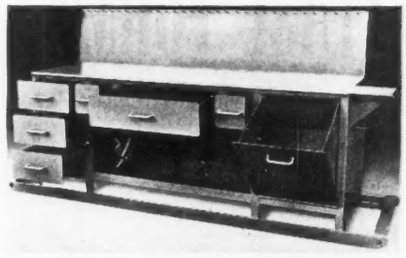
Holding Company

"What's a Grecian urn?"

"It depends on what he does."

OWEN

TYPE "A" WORK BENCH



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There's space in this all-steel, all-welded bench for all the hand tools on any drilling rig. Six big drawers and a rag bin, with a total of over 14 cubic feet of storage space, plus the tool pegs on the back apron, provide room for keeping all tools protected against damage and loss.

Buy one for each rig you own . . . they'll pay for their cost in the savings they effect.

SOLD THROUGH ALL SUPPLY STORES

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Cecil C. Irby, manager of the Michigan producing division, Sohio Petroleum Company, has been appointed to the State Oil Advisory Board to fill the vacancy created by the transfer of Glenn Bish, The Ohio Oil Company, from Michigan to Tulsa. Irby has been active in the Michigan oil industry for 13 years and head of Sohio's producing division in Michigan since August, 1943. Prior to that he was with Gordon Oil Company and Turner Petroleum Company in charge of production operations.

Cecil C. Irby

⌄⌄

R. W. McIlvain, Jr., has been transferred to Billings, Mont., where he will be Rocky Mountain producing division manager for The Pure Oil Company.

⌄⌄

W. E. Blackman, geologist on the West Texas staff of the Barnsdall Oil Company and an employe for 11 years, has resigned.

⌄⌄

Jerry Honeycutt, scout for The Texas Company in the Texas Panhandle and North New Mexico, has been transferred from Pampa to Denver for duty in the Rocky Mountain division. He has been succeeded by **Dalton H. Cobb,** who has been scouting West Texas with headquarters at Midland.

⌄⌄

R. T. Thompson, general superintendent for Stanolind Oil Purchasing Company, has transferred his office from Tulsa to Cushing, Okla. All matters pertaining to operation and maintenance of tank farms, with the exception of Beaumont, Texas, will be handled through the Cushing office.

⌄⌄

Bouwe Dykstra has been named area manager at Midland, Texas, in connection with Shell Oil Company's reorganization and expansion program in that territory. Dykstra has been with Shell since 1926 and has had extensive production experience in Roumania, Sumatra and Colombia, as well as in the U. S. He was in the West Texas territory as district engineer in 1932 and 1933. He held various positions in the Gulf Coast area until 1936, when he went to Tulsa as chief exploitation engineer, a position he held until his transfer to California in 1939.

Bouwe Dykstra

Roy Mays, chief scout for The Pure Oil Company, Fort Worth division, has been transferred to Billings, Mont., to become a landman in the latter district. He is succeeded by **Charles R. Evans,** who has been scouting for the company in the Owensboro, Ky., district.

⌄⌄

W. D. Smith of Wilshire Oil Company, Inc., Los Angeles, has been elected secretary-treasurer. He has been connected with the company since its founding.

⌄⌄

Charles F. Schock, district landman at Jackson, Miss., for Stanolind Oil & Gas Company, will move to Oklahoma City September 1 to replace **J. G. McMillan,** resigned.

⌄⌄

T. R. Aude has been promoted from chief engineer to assistant general manager in charge of engineering for Stanolind Pipe Line Company. **J. P. Polston,** former assistant chief engineer, has been named chief engineer.

⌄⌄

A. M. Orr, assistant district superintendent for Humble Oil & Refining Company at Stratton, Texas, has been promoted to Scott & Hopper district as superintendent. He has been with the company since 1919.

⌄⌄

Roland F. Beers and **William B. Heroy** have formed the firm of Beers & Heroy, with offices in the Tower Petroleum Building, Dallas. Beers was president of The Geotechnical Corporation and Heroy was formerly director of foreign production for PAW. The firm will serve as consulting geologists, geophysicists, and engineers to the petroleum and mineral industries.

F. A. Graser, for 15 years a consulting petroleum engineer at Long Beach, Calif., will become associate professor of petroleum engineering at the Missouri School of Mines, Rolla, Mo., commencing September 9. Since his discharge from the Army Field Artillery after World War I, Graser has been engaged in petroleum work in California. He is a member of the AAPG and is a past chairman of the Los Angeles Basin chapter of API.

F. A. Graser

⌄⌄

J. Earl Franch has been named West Coast manager for Maritime Petroleum Corporation and Samuel F. Pratt Associates, Inc., New York and will headquarter in Los Angeles.

⌄⌄

Dr. George H. Ashley, chief of the Bureau of Topographic and Geologic Survey, Pennsylvania, Department of Internal Affairs, has retired, to be succeeded until December 31 by his assistant, **Dr. Ralph W. Stone,** who will also then retire. Ashley became state geologist in 1919, after service with the Arkansas Geological Survey, as assistant state geologist of Indiana, as state geologist of Tennessee, and with the United States Geological Survey in Washington, D. C. Stone worked with the United State Geological Survey as geologist and chief of section of nonmetals in the mineral resources division from 1901-21, when he resigned to accept assistantship to Ashley.

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J. A. Clay, Jr., former equipment engineer for Stanolind Oil & Gas Company in the Fort Worth division, and **Guy G. Crawford,** recently discharged after four years in the South Pacific with the Army Engineers, have organized Service Engineers, Inc. Headquarters have been established in the First National Bank Building, Fort Worth, with a branch warehouse at Midland, Texas. The firm will specialize in mechanical and electrical engineering for the producing branch of the oil industry.

James D. Smullen has been promoted from acting head to assistant in charge of the Attorney General of Texas' oil, gas and rate division. He has been assistant attorney general since 1939, serving in the administrative, law enforcement, taxation and oil, gas and rate divisions. During the war he was a special assistant and counsel for land acquisition and public works matters in the Fourteenth Naval District at Pearl Harbor. He is a graduate of the University of Texas.

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Deaths

A. J. Cunningham, 60, president of Standard Oil Company of Texas, died August 20 in El Paso. He joined the firm in 1926 as superintendent of the land and lease division and progressed through assistant managership and managership of the department. Following the company's reorganization in 1941, he became director and president. He was also president and director of the Pasotex Pipe Line Company.

A. J. Cunningham

P. V. Kors, 64, Independence, Kansas, secretary to the vice president in the pipe line department of Sinclair Refining Company, died in Rochester, Minn., August 19 of a paralytic stroke. Born in Virginia, Ill., Kors joined Prairie Oil & Gas Company in 1910 as a clerk in the general offices at Independence. He was transferred to Prairie Pipe Line Company in 1915 and shortly afterwards was appointed assistant secretary.

Edward D. Avery, 72, Tulsa, retired independent oil operator, died of a cerebral hemorrhage in Edmonton, Alberta, Canada, August 20. Born in Ridgeway, Pa., Avery moved to Tulsa in 1910 and entered the oil business. He had been inactive the last ten years but held leases near Turley, Okla.

William H. Pullman, 57, died August 19 at Dallas. He was membership secretary of the Texas Mid-Continent Oil and Gas Association and oldest member of the staff in point of service, having joined the organization as office manager soon after its formation in 1919. He began his business career in Conroe, Texas, where he was born.

LeRoy Vernon McCool, 49, Tulsa, employe of Jones & Laughlin Supply Company, died in Tulsa August 18 following a heart attack.

Benjamin F. Robinson, 82-year-old pioneer Oklahoman and oil well driller, died in Tulsa August 18. He went to Tulsa from West Virginia in 1905.

Mel B. Davis, 55, president of the LeFors Petroleum Company, died in Pampa, Texas, August 18 of a heart attack. He helped organize the Texas Panhandle Producers & Royalty Owners Association, and was a director of the Independent Petroleum Association of America.

ALCOA Executive Gives Report On U. S. Aluminum Production

The national's total aluminum production capacity, boosted seven-fold during World War II, although now largely reconverted to a soundly economic basis, is still four times as large as in the peak prewar year, according to George R. Gibbons, senior vice president in charge of sales for Aluminum Company of America. Despite this increased production capacity, however, shortages in supply of many semi-fabricated and finished aluminum products exist, and will continue to exist for some time to come, he said.

"Misunderstanding about the nation's supply of aluminum often arises from confusion between production capacity and actual production," Gibbons stated. "Actual production figures correspond to the amount of metal which is really made by the producers. Capacity, on the other hand, is simply a measure of available production facilities, and doesn't indicate whether such facilities are in full or partial operation."

The fact that there are shortages despite the vast national capacity is explained, according to Gibbons, because strikes, slow-downs, material shortages, rising costs, and other related factors added to the delays of the reconversion process have retarded production.

The nation's capacity to produce aluminum from the ore on a competitive integrated basis is now in the hands of private operators who have facilities to make the metal at a rate of well over a billion pounds a year, Gibbons pointed out.

C. W. Hagenbuch Is Appointed Vice President of Sheffield

C. W. Hagenbuch has been named assistant vice president of Sheffield Steel Corporation, Kansas City, Mo. He will have under his direction the development and merchandising of new products as well as overall production and mill scheduling of all Sheffield products. He has been associated with the company for 26 years, starting as plant efficiency engineer, and has served as head of the cost accounting department, in the development and sales of products, as office manager and production manager, and manager of grinding media.

C. W. Hagenbuch

Store Managers Are Appointed by The Continental Supply Company

The Continental Supply Company has announced appointment of A. M. Rouse as manager of the Pratt, Kansas, store, replacing D. L. Smith who has been transferred to the Ellinwood, Kansas, store as manager. Smith succeeds G. H. Slack at the latter point. Both stores operate under the supervision of F. B. Collett, Continental's assistant district manager at Wichita, Kansas.

G. H. Slack, former Ellinwood store manager, has been named manager of the Denver office, which operates under the supervision of J. R. Chapman, district manager at Casper, Wyo.

Westinghouse Awards Made

Three annual Westinghouse research scholarships of $1000 have been awarded to Julia Senke, Julius Miklowitz, and Dennis R. Turner, members of the Westinghouse Electric Corporation Research Laboratories staff. Under the graduate scholarship plan each recipient selects the university and course he plans to pursue. Three awards are made annually for the duration of one academic year.

Offices Moved

The Allegheny Ludlum Steel Corporation has moved executive offices to the Henry W. Oliver Building, Pittsburgh.

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Sunray Changes

Sunray Oil Corporation's Gulf Coast division offices are being moved from Victoria to Alice, where Carl Wilson, former superintendent of Traswestern Oil Company's Texas division, will head the reorganized Sunray division. Alvin Summers, who was superintendent of Sunray's Gulf Coast division, has been transferred to Oklahoma City as superintendent of the northern and western Oklahoma division.

Sunray's Gulf Coast division now has four districts and superintendents have been named as follows: Hebbronville, J. A. Parry; Nordheim, Charles P. Baker; Victoria, John Myrick and Premont, Howard Fish.

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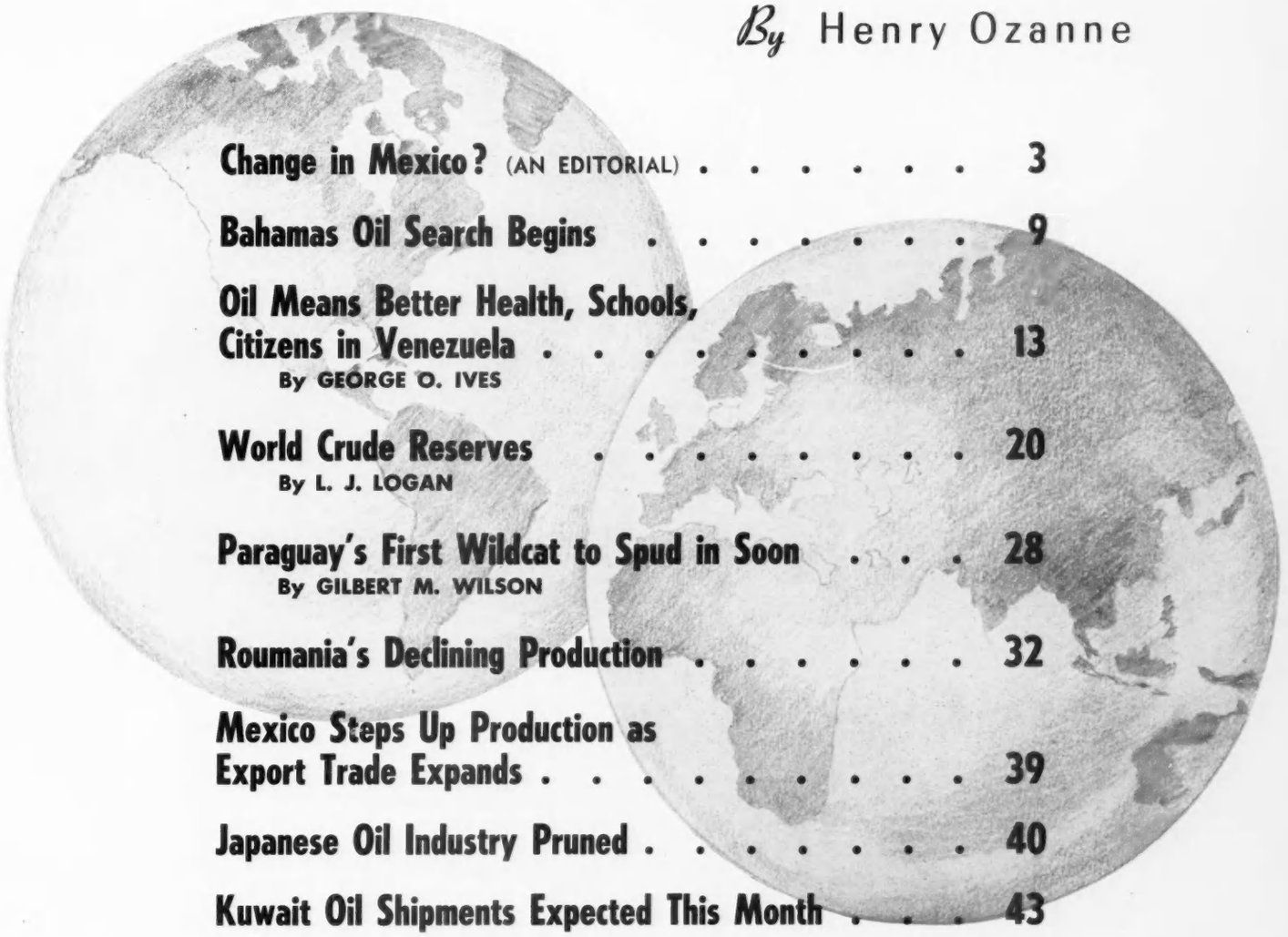
By Henry Ozanne



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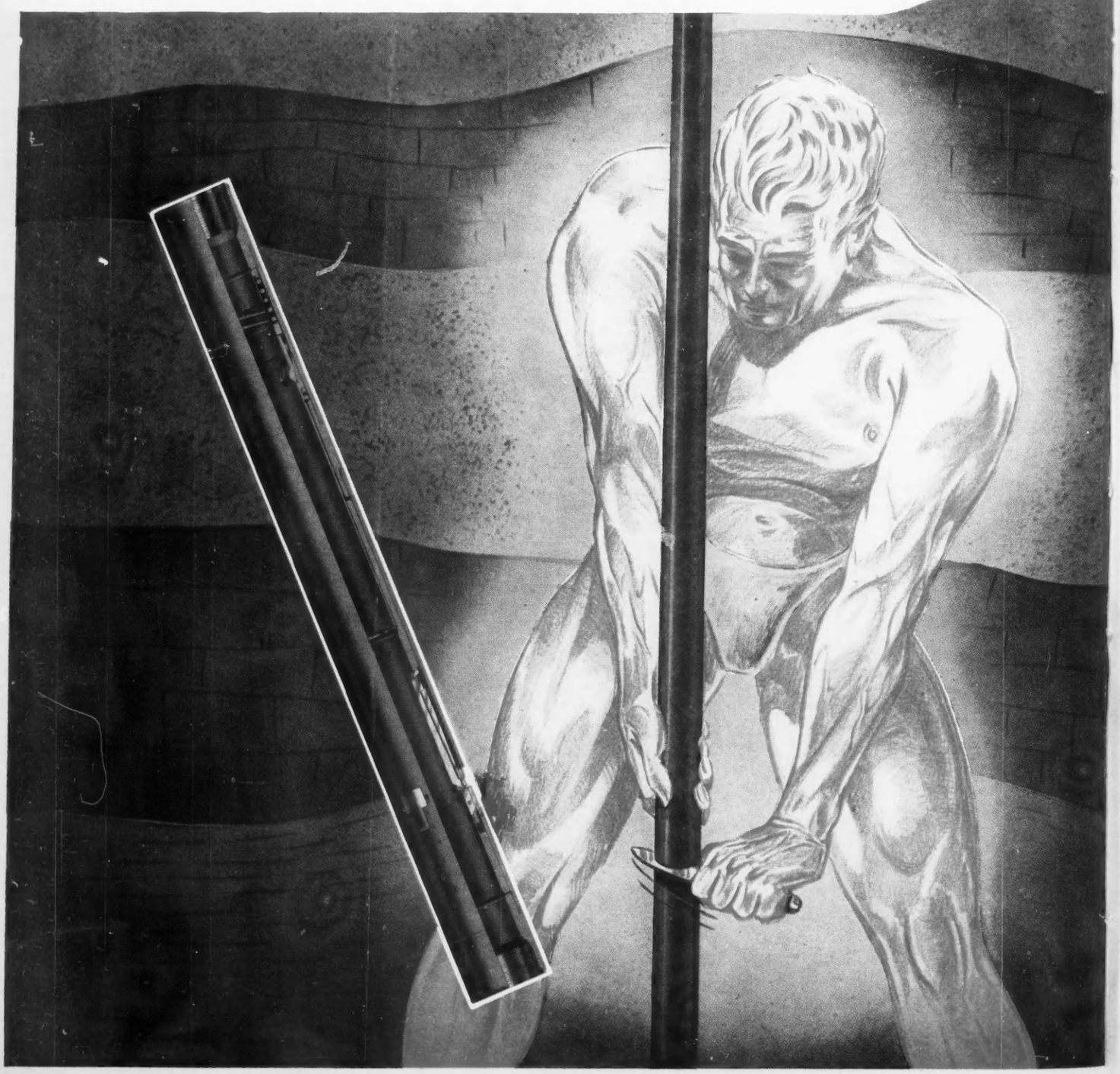


CHANGE IN MEXICO?

THE rumor that the Mexican government contemplates a change in its petroleum law which will in effect be an invitation to American and other companies to return to Mexico with investments in oil is so persistent and comes from so many sources that THE OIL WEEKLY is convinced that there is something to it.

The latest reports are that the change will be proposed after the presidential elections in Mexico, that the new law will provide for "operational contracts" under which outside capital would be invited to make a contract with the Mexican government to develop prospective oil property. The sub-soil rights would continue to belong to the Mexican government, but the investing company would receive ⅞ or some other portion of the oil produced in return for its investment and management.

The operational contract differs from the outright concession in that the government making the contract retains, in the contract itself, the ownership of the oil in the ground. It is argued that to all practical effect the oil company entering into such a contract has the same chance to make a profit as is the case when a lease or concession on the property is given the company by the government.

It seems to THE OIL WEEKLY, however, that the position of the oil company operating under a contract is so different from that of one holding a lease or concession as to make the contract form substantially less desirable. For instance, we doubt if any oil company in the United States would be willing to enter into a contract within the United States under the terms of which it actually owned only the physical equipment used in developing the property.

In Mexico, however, the government will have several problems to solve other than simply that of the form of agreement which might be offered foreign investors. It is a notorious fact that the operations of the Mexican government oil company have been badly hampered by a labor situation which it inherited under expropriation. In fact, many impartial observers who have studied the Mexican situation have expressed the opinion that the government-owned oil company hasn't a chance of carrying on a successful operation because of the attitude of the labor union involved in oil operations there. It was the incredibly unreasonable position taken by oil labor which led to expropriation, although substantial argument can be offered that the Mexican government under President Cardenas (still the biggest political power in Mexico) had determined definitely upon expropriation and seized on the labor difficulties the oil companies were experiencing as the excuse to expropriate.

It is true that for a while the government oil operations in Mexico were hampered by lack of equipment, but there is now no reason why such shortage should hold back exploratory and development work. Petroleos Mexicanos, the government-owned oil company, has some excellent men in its employ, men thoroughly capable of carrying on a successful oil operation.

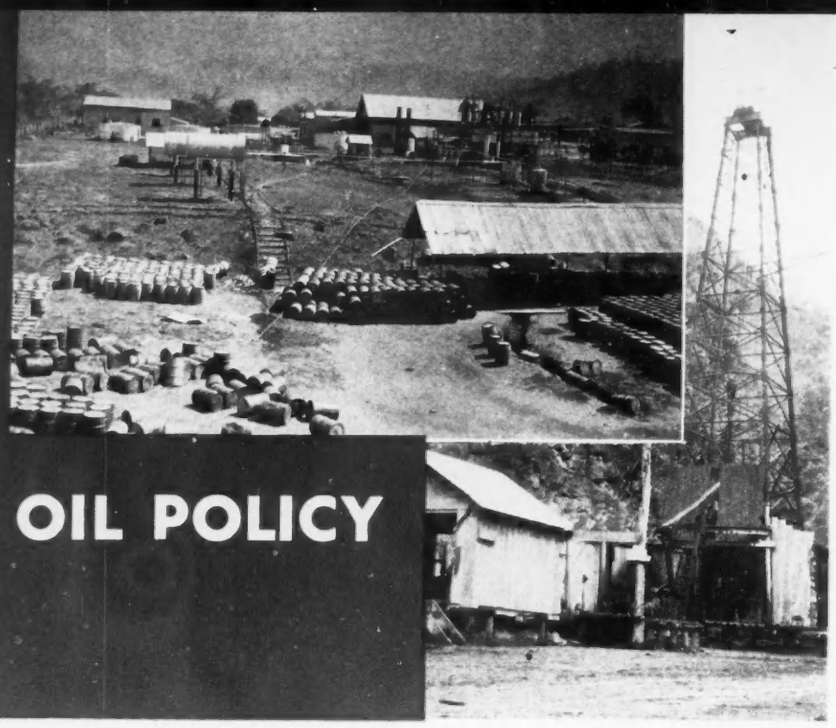
Normally one of the greatest obstacles in the way or a genuinely successful government oil operation abroad lies in the fact that the government is seriously handicapped in finding an adequate market for its surplus product outside its own boundaries; and an operation which has no surplus, has difficulty in serving its country fully in time of real emergency. In the case of Mexico, however, the company has not been able to provide all of the petroleum products needed by the Mexican people themselves. Failure of the marketing branch for one reason or another (frequently reasons completely beyond the control of the company because of operating conditions it faces) has been reported on more than one occasion. As a matter of fact, gasoline for Northern Mexico has been imported from the United States and at other points motorists have had difficulty in getting gasoline. Black market gasoline is to be found, it is reported, on the Pan-American highway from Mexico City to the United States, and some motorists have said that without it they could not have made the trip!

With reference to the labor situation on oil in Mexico, it has been reported to THE OIL WEEKLY that Mexican oil labor would welcome the return of American oil companies to Mexico. Possibly that is true, but with some of the world's most notorious labor agitators resident in Mexico, it would likely be but a question of time until the goose laying the golden egg would go to the block again.

We have no doubt of the possibilities of developing great oil reserves in Mexico. In our mind there is no question as to their being there. But Mexico will likely find American oil capital very cautious in going back into Mexico. The same thing applies to English capital because the Mexican government and the Shell interests have not yet settled their difficulties arising from expropriation. The adage "A burnt child fears the fire" has been translated into many languages.

If the Mexican government is in earnest about inviting foreign capital to reenter the Republic, it is our suggestion that it first take steps on the labor line to help its own company make a better showing.

Bolivia PLANS NEW OIL POLICY



Bolivia's proposed pipe line from Camiri to Tintin will be served by several refineries in southern part of the nation including the small topping plant shown in the top photo. Also pictured is a rig in action at Camiri.

By HENRY OZANNE
Staff Writer

BOLIVIA has just mapped a sharp reversal of its petroleum policy as followed since 1937, and will speed through the Bolivian Congress this year new oil legislation designed to attract outside operators and particularly to entice U. S. capital.

In furtherance of this "right-about" policy move, Jorge Lavadenz, president of Bolivia's oil monopoly, the Yacimentos Petroliferos Fiscales Bolivanos YPFB), is to arrive in New York this month for a series of interviews with groups of possibly interested North American operators.

The proposed new policy is in complete contrast with the bitter situation that prevailed in Bolivia for two years following the expropriation of the properties and concessions of Standard Oil Company of Bolivia, subsidiary of Standard Oil Company of New Jersey, in 1937. The change is prompted by the acute postwar need of Bolivia to step up exports and to industrialize in the face of tightening economic conditions.

While Bolivia will be prepared to welcome all comers, an authority close to the YPFB informed THE OIL WEEKLY that the nation's preference will be to deal with small U. S. oil operators "who will actually get the oil out of the ground for us." No indication has been given that Standard will seek to reenter Bilivia.

Mixed Company Program

Bolivia plans to promote her petroleum development through the typical "mixed company" program, but is reserving for YPFB exclusive rights in the presently most productive parts of the country. The hope is that foreign investments can be persuaded to seek production on two prospects which have been worked but in which no drilling has yet been done. These are the Chapare area in the center of the country, and the Caupolican region near the Peru border.

Pipe Line Planned

In anticipation of increased production, Bolivia has approved the construction of the new six-inch pipe line from the Camiri fields to Tintin, about 225 miles.

The Bolivian Congress will convene August 6 and quick approval is forecast for the new petroleum legislation which has been drafted and the passage of which has been asked by President of the Republic Villarroel. Any deals which YPFB makes in the meantime, such as the result of negotiations arising out of Lavadenz' trip here, will pend the passage of the new law for final ratification.

The Sub-Andean Zone is the only one of the three principal oil areas in Bolivia that so far has yielded commercial quantities of petroleum. This zone forms a belt 750 miles long by 60 miles wide from the Peruvian border north of Lake Titicaca, stretching in a southeasterly direction toward the city of Santa Cruz, thence southward to the Argentine border. All present productive fields are in the southern part of this zone.

Small U. S. operators who will get oil out of the ground in a hurry will be most welcome in the new "right-about" policy

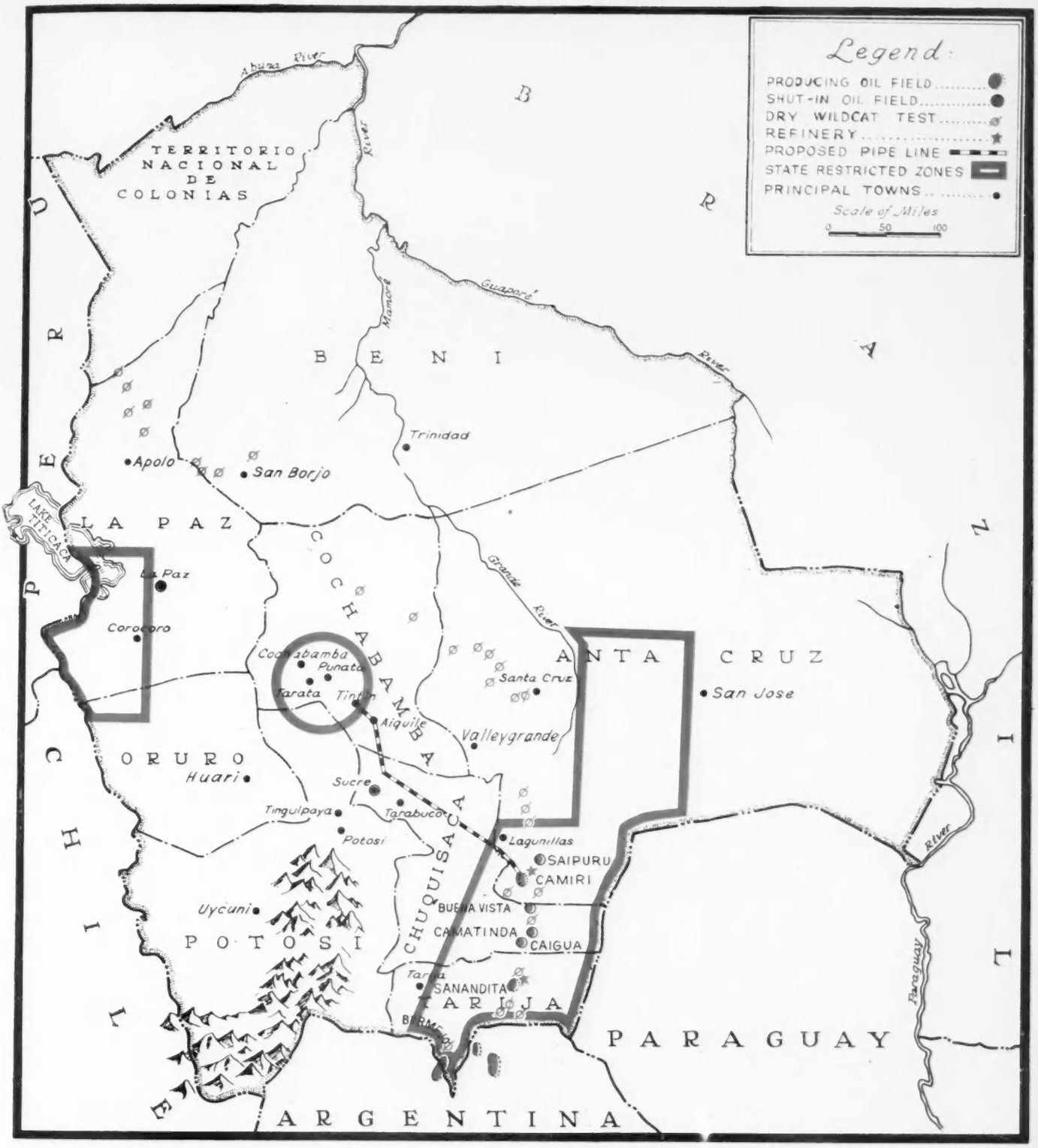
The second oil area lies along the eastern and southern border of Lake Titicaca, on the Andean plateau at an elevation of 13,000 feet. This territory is covered by volcanic tuffs and ashes.

The third area, the Central Zone, is in the Department of Cochabamba.

Sub-Andean Fields

The principal fields in the Sub-Andean Zone are those of Saipuru, Camiri, Buenavista, Camatindi, Sanandita and Bermejo. Saipuru has two shallow, shut-in wells. The field is under jurisdiction of the Bolivian-Brazilian Mixed Commission which plans to drill a dozen more wells in the field. The Camiri field is the most productive. It has nine wells and a 700-barrel topping plant. Potential production is around 700 barrels a day, of which currently about half is being produced. Sanandita has 12 wells producing from the non-marine Permo-Triassic formation, and Bermejo has six.

Bolivia in 1916 placed all its oil deposits in the Fiscal Reserve, stipulating that henceforth concessions could be



granted only if the government were made a partner on a royalty basis. In 1920 Richmond Levering Company, of New York, obtained a grant covering, finally, 2,471,043 acres, a concession which in a reduced form was later transferred to Standard Oil Company of New Jersey. By 1936 the Standard grant included 741,313 acres covering the best zone in the Department of Santa Cruz. Here Standard drilled a total of 30 wells from 1922 to 1928.

Standard Expropriation

Bolivia's petroleum legislation dates from the Law of 1920, under which it expropriated Standard in 1937. Previously, in 1936, the Bolivian Government had created YPFB, which was given the right to enter into partnership with private concerns, although this right was never exercised.

Standard claimed losses of $17 million through the confiscation action and instituted suit in the Bolivian Supreme Court in 1938, demanding either restoration of the properties or arbitration of its claims. When the Bolivian court dismissed the company's petition, Standard asked the U. S. State Department to

Loading terminal for small plant in Sanandita field.

intervene, and later the Bolivian Senate reviewed the expropriation action. During this process of litigation, feeling ran high and the issue was one of the sharpest ever centering around American oil interests. The case was closed on April 22, 1942, when Bolivia paid Standard $1,729,000 as full compensation.

Summary of Pending Bolivian Law Relative to the Organization of Mixed Companies for the Exploitation of Oil

Section I

All surface and subsoil deposits are property of the state. Exploitation shall be by the state through Yacimentos Petroliferos Fiscales Bolivanos (YPFB) under its own management or through mixed companies.

Three zones are placed under exclusive authority of YPFB. First zone—From the Argentine border at the 65th meridian, along the border to the Paraguay frontier; thence along the frontier to the 61st meridian, thence along this meridian north to the 17th parallel, thence west to the Sub-Andean zone, thence along its eastern boundary south to the Parapstibis River, thence west to the 64th meridian; thence on a straight line to the starting point. Second zone—A circle of 75 kilometer (46.6-mile) radius with the town of Cliza as center, in the Department of Cochabamba. Third zone—Bounded to the north by latitude 15.50, east by longitude 68.50, to the south by latitude 18, west by the Peruvian and Chilean border.

The balance of the Republic is open to mixed companies.

Section II

Mixed companies shall be stock companies, formed by YPFB and private institutions. YPFB participation shall be not less than 20 percent of the stock holding; YPFB to receive all dividends over and above royalty and other income due the state.

YPFB shall receive 5 to 10 percent of stock where acreage is in unproved area; in proved areas the proportion is to be determined by evaluation.

In the organization of mixed companies, parties may apply for an exploratory concession up to 200,000 hectares (494,200 acres); the company then shall deposit $100,000 to the order of YPFB as guaranty. If concessionnaire asks cancellation of concession prior to starting geological work, it forfeits 50 percent of guaranty. If concession holder does not complete geological work within allotted time, it shall forfeit $100,000 yearly for every year exceeding the time limit.

Mixed companies shall have a Board of Directors of 5, of which 2 shall be named by YPFB.

Section III

Concessions up to 200,000 hectares (494,200 acres) are granted for four years, covering two stages: (1) geological and geophysical exploration for two years, beginning 270 days after concession is granted; (2) drilling exploration up to two years beginning in continuation of first stage.

Of the original 200,000 hectares, the company shall select 40,000 (98,840 acres) to constitute the area under exploitation concession.

Exploration concessions shall be laid out in rectangular form, long side not to exceed five times length of small side; in exploitation concessions, seven times length of small side. Number of rectangels limited to four.

Well being drilled with portable machine in Sanandita field.

Section IV

Term of exploitation is divided into two stages: (1) preparatory, two years, during which company shall drill one well to 2000 hectares (4942 acres), or one well for each rectangle of concession; (2) production stage, following first, lasting as long as oil is produced in commercial quantities. In this period the company shall produce wells of at least 50 percent of potential which is defined as production obtained at lowest gas-oil ratio.

First drilling must start within 270 days of preparatory stage; production to start within 180 days after production stage becomes effective, provided there is a ready market.

Section V

Concessions are forfeitable for failure to survey exploration and exploitation area, failure to comply with any sections of the law, stoppage for 90 days, failure to pay taxes.

Section VI

Annual land tax is two Bolivianos per hectare, payable at end of each semester, for exploratory concessions; and five Bolivianos for exploitation concessions in preparatory stage. (Editor's Note—One Bolivianos on Jan. 31, 1946, was equivalent to 2.36 cents.)

Section VII

Companies shall have the right to produce, transport, refine, sell and export through YPFB; to build facilities, to build, acquire, own and operate railroads, canals, roads, ferries, airports. Companies can build pipe lines and import free of duty all tools, fixtures, materials, machinery.

Section VIII

Companies must report semi-annually, provide specified safety devices and as owners of pipe lines must carry products of neighboring companies lacking such facilities if line capacity exceeds owners' needs.

Section IX

In production stage, mixed companies shall pay royalty in crude oil or in money, at choice of government. Royalty rates shall be:

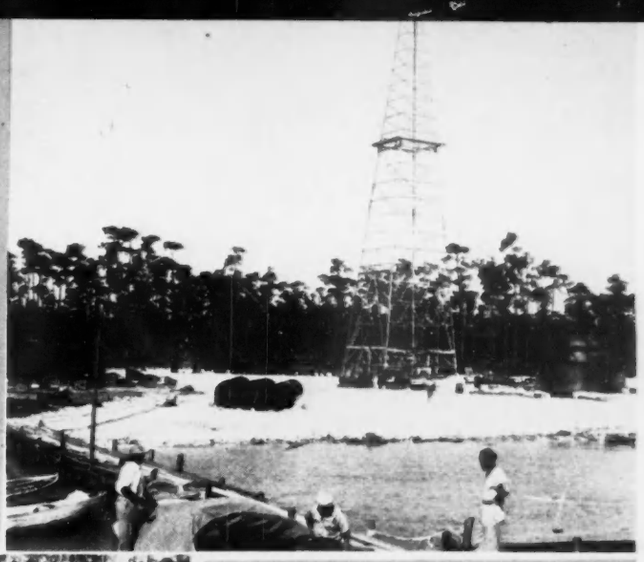
Daily Average Production per Well	Royalty
From 1 to 10 cubic meters	4%
In excess of 10 to 15 cubic meters	5%
In excess of 15 to 20 cubic meters	8%
In excess of 20 to 25 cubic meters	11%
In excess of 25 to 30 cubic meters	14%
In excess of 30 to 50 cubic meters	17%
In excess of 50 cubic meters.....	20%

(NOTE: One cubic meter equals 6.29 barrels.)

If companies do not sell crude production, they shall refine the amount of crude representing royalty due the state and deliver products obtained; refining to be done at cost plus 5 percent.

Companies shall store oil due the state free of charge for a maximum of a month.

Bahamas Oil Search Begins



Above, first well drilled in the Bahamas by Bahamas Oil Company (subsidiary of The Superior Oil Company). It is in the approximate center of the northern end of Andros Island.

Left, type of vegetation and terrain that had to be cleared in preparing well location. Native workmen are shown cooking beside their thatched huts.

THE search for oil in the Bahama Islands is actually under way with the Bahamas Oil Company (The Superior Oil Company of California) having spudded its first wildcat test on Andros Island.

Seven American, British and Bahamian oil companies hold concessions in islands totaling 47,399 square miles (30,335,360 acres). The concessions include the waters surrounding the Bahamas. The applications of two other companies for concessions are reported being considered by the Bahamas government.

The largest concession, totaling 12,925 square miles (8,272,000 acres) is held by the Anglo-Bahamian Petroleum Company, Ltd., (Anglo-Iranian Oil Company). Bahamas Oil Company, Ltd., holds concessions amounting to 8996 square miles (5,757,440 acres).

Standard Oil Company (New Jersey) through its locally-registered company, Standard Oil (Bahamas) Ltd., holds a concession of 8474 square miles (5,423,360 acres); British Bahamian Oil Development Company, Ltd., (Central Mining & Investment Corporation), 6434 square miles (4,117,760 acres); Shell Overseas Exploration Company, Ltd., (Anglo-Saxon Petroleum Company), 5392 square miles (3,450,880 acres); Bahamas Oil Exploration Company, Ltd., (Gulf Exploration Company), 3676 square miles (2,352,640 acres); and Nassau Oil Mining Company, Ltd., (Local company), 1502 square miles (961,280 acres).

Bahamas Mining Company, Ltd., and Texas Petroleum Company, Ltd., are reported to have applied for acreage.

Of the seven companies holding concessions, only three now are actually showing any signs of development. These are Bahamas Oil Company, Anglo-Bahamian and Standard Oil (Bahamas).

Superior's Activities

Most progress toward actually determining the possibility of commercial oil production in the Bahamas has been made by the Superior subsidiary.

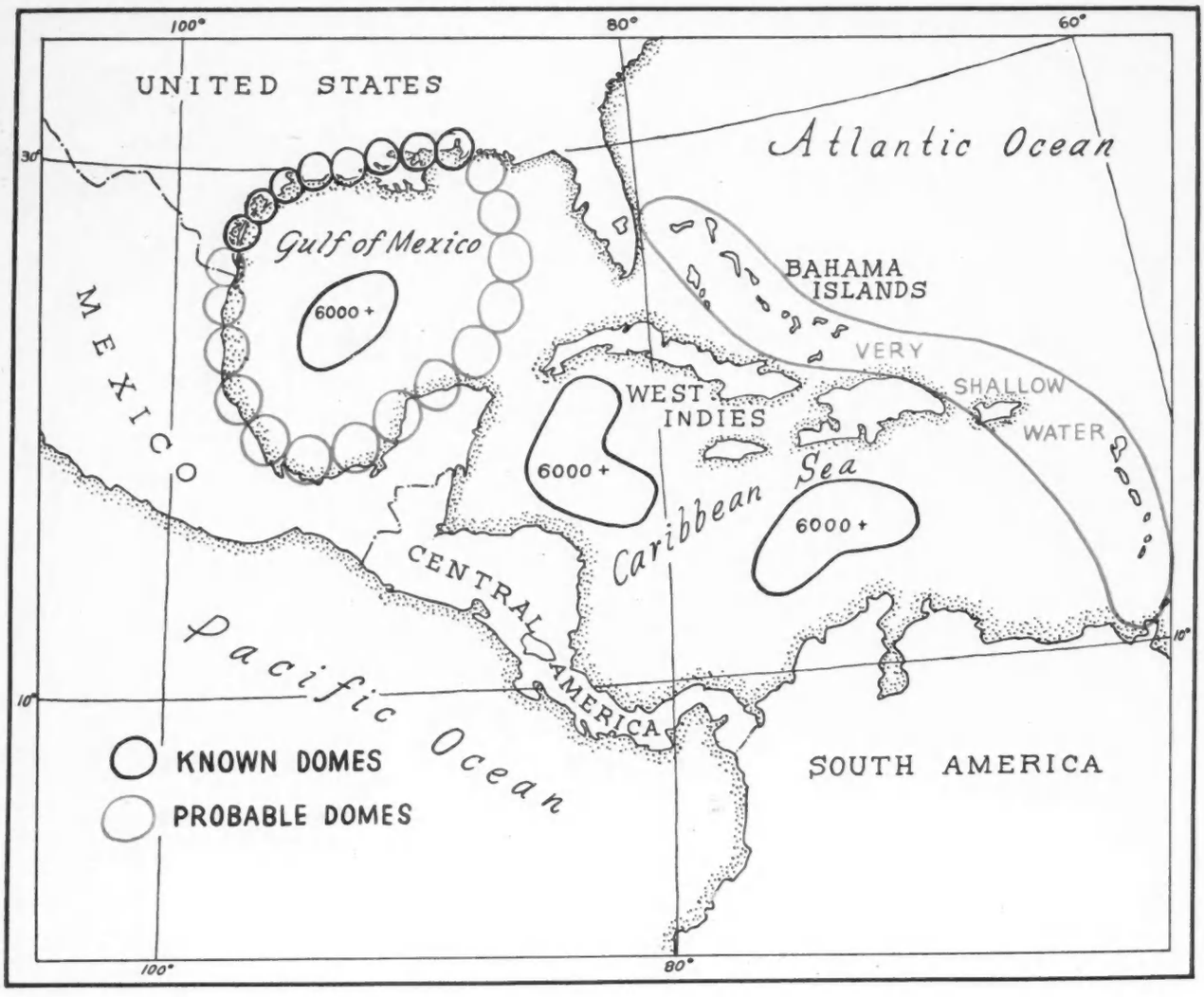
The company has set up permanent headquarters in Nassau and has been conducting geophysical work since the latter part of 1945, when a gravity meter crew and marine seismograph unit were moved to the islands. The first stage of the seismograph work has been completed and the unit moved back to a job in southern Louisiana. These operations were in the Bimini Islands between the main Bahama group and the mainland. The gravity meter crew is still at work on the islands. Superior's geophysical work in the Bahamas was directed by K. G. McCann of Superior's Houston office.

Seven American, British and Bahamian companies hold concessions in the islands and two other concerns seek acreage

In November, 1945, Superior staked its first location in the approximate center of the northern end of Andros Island about nine miles inland from the mouth of Stafford Creek, a short but unusually wide river flowing generally eastward. The derrick was erected on the beach beside the river and heavy equipment and materials were brought in by boat and unloaded at a pier immediately beside the well site.

The test, spudded during the latter part of April of this year, is slated to 10,000 feet or deeper.

The company had two barges and a tug making two trips a week between Miami and the location to move in the drilling equipment. A 98-foot, self-propelled houseboat is tied up at the well location and has accommodations for about 25 men. A second houseboat on a steel barge which is designed to ac-



commodate another 30 to 35 men, is being readied. This houseboat will be equipped with every modern convenience such as refrigeration, dining hall, etc. The boat was built at Nassau.

Other water equipment includes nine or ten speed boats and express cruisers which operate either in the Nassau or Andros Island sectors. A supply boat and oil barge regularly shuttle between Nassau headquarters and the Stafford Creek location. In addition, a two-engine amphibian plane, normally based at Nassau, transports personnel and supplies to the well site.

The company has leased five houses and six apartments in the Bahamas and much of the personnel has their families with them.

Key Personnel

Key personnel in the Bahamas Oil Company organization includes R. M. Allen, Jr., first vice president and also vice president of Superior; B. R. Kunau, second vice president and manager of operations at Nassau and formerly district drilling superintendent in San Joaquin Valley operations in California; J. A. Mull, district geologist for the Bahama region and former supervising geologist for Superior at Oklahoma City; R. L. McFall, formerly with Gulf Oil Corporation at Midland, Texas, assistant geologist, and John C. Cody, superintendent of the drilling operations in the Bahamas. Cody also is Pacific division drilling superintendent for Superior.

Standard Oil Company (New Jersey) has a gravity crew on Grand Bahama Island, which is on the west end of the Bahamas group. A water crew of approximately ten men is doing the work. While it is generally land work at this particular concession, the crew is based in boats. The company maintains an office at Nassau.

Key personnel attached to Standard Oil (Bahamas) includes E. F. Whittingdale, manager of the company's operations with headquarters in Nassau, and R. J. Watson, exploration manager. Watson was formerly with The Carter Oil Company at Tulsa, and recently replaced Jack Gallagher, geologist specializing in foreign work for Standard Oil, who has left the Bahamas for work in Peru.

Anglo-Bahamian Petroleum Company, a subsidiary of Anglo-Iranian, are in the process of moving in equipment for work in its concession at the south end of Andros Island. The equipment is being shipped from England and the nature of the equipment is not known. The company has a geologist and two or three geophysicists stationed in its headquarters at Nassau. William Dowling is manager of operations for the company in the Bahamas.

As yet, none of the other foreign companies holding concessions in the Bahamas have opened offices in the islands.

The British government agency in charge of oil exploratory work in the Bahamas is the Petroleum Board at Nassau. Frank Field is acting chairman of the board.

OIL MEANS BETTER HEALTH, SCHOOLS, CITIZENS

In Venezuela

By GEORGE O. IVES, Staff Writer

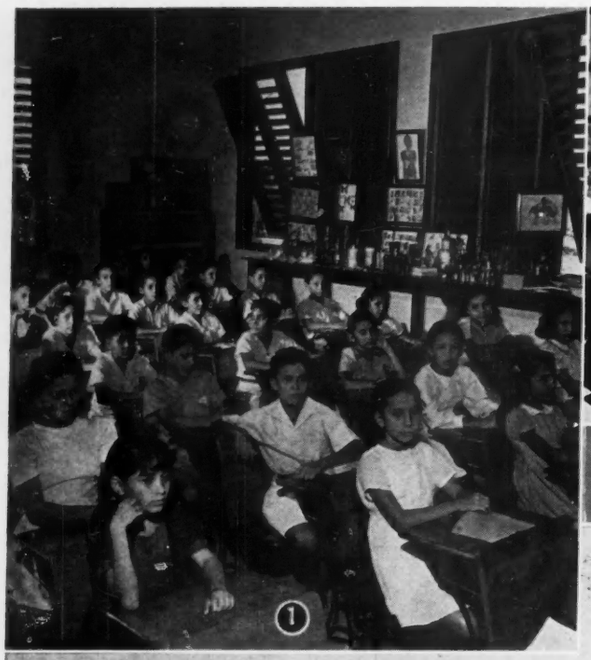
ANYONE who has toured the oil regions of Venezuela cannot help but be impressed by the contributions of the oil companies to the social and economic structure of the country.

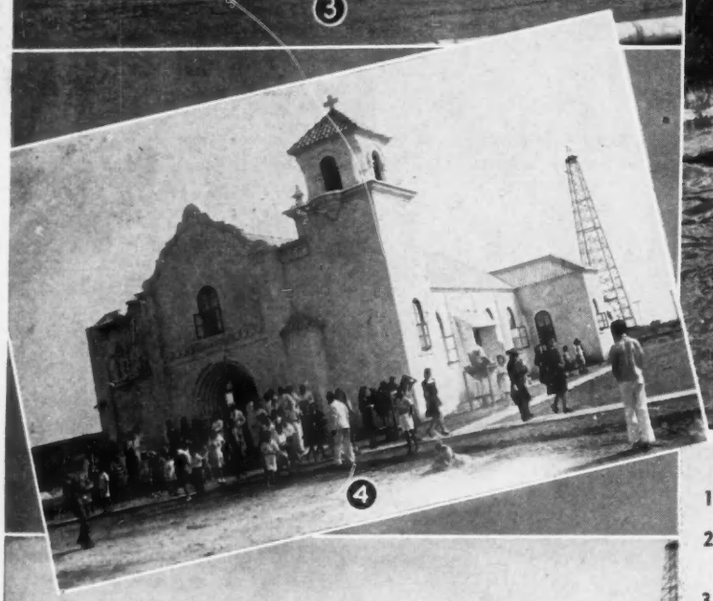
No industry in the world is more progressive than that concerned with the discovery, development, production, refining, transportation, and marketing of petroleum and its products. Under ideal conditions a tremendous amount of money is expended by oil companies in exploitation, and as a matter of simple common sense its leaders recognize that the key to success of any such enterprise lies in its personnel. Disregarding all humanitarian impulses, it is considered good business and a protection of investment for the companies to see that conditions under which all its personnel work and live are as healthful and comfortable as possible. This is being done and done well.

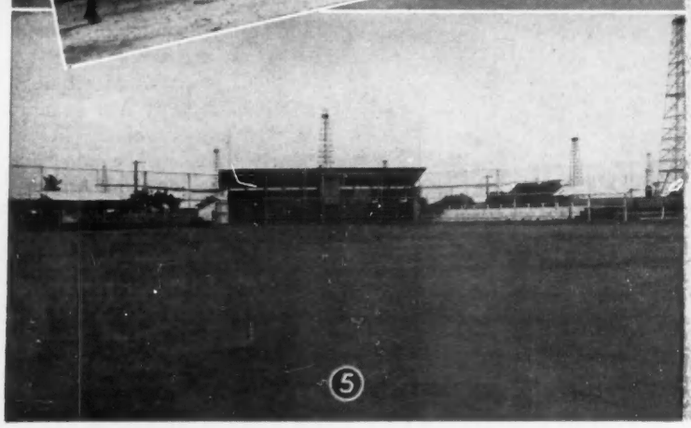
Oil companies of Venezuela are proud of what they have accomplished along these lines. In most instances a simple improvement of conditions was not enough. Conditions were changed completely. When an oil field is discovered the first concern of the company is to provide living facilities for its staff and workers. To realize what this entails it is only necessary to see such a camp, a thriving "town" of 5000 to 6000 population where shortly before there was nothing but jungle or open plain.

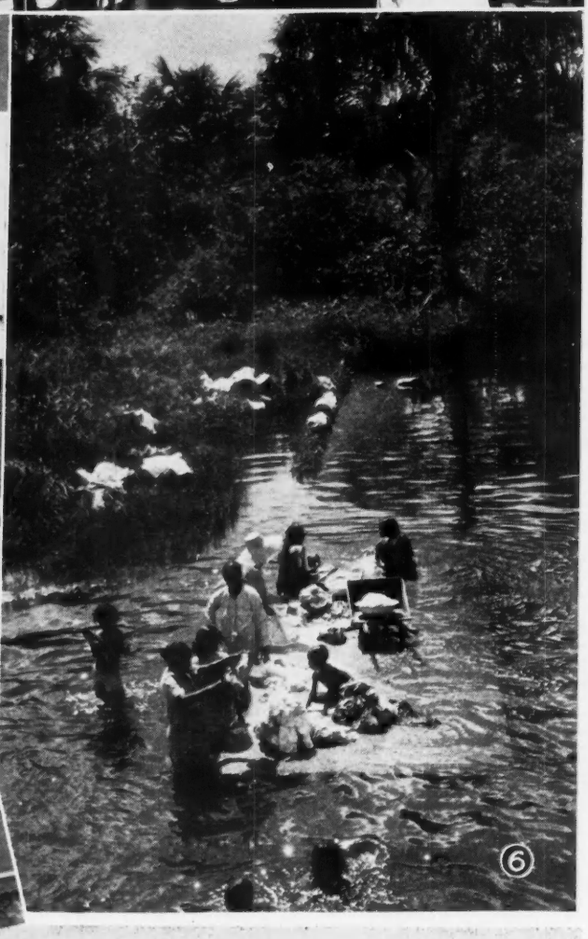
Making Life Liveable

A modern oil field camp is not merely a collection of huts or houses in which men may sleep and eat. It is a complete municipality. Much planning goes into the entire layout before construction begins, and the whole program is obviously designed for the best possible combination of utility and that previously intangible something called "conditions." Certainly there must be warehouses, shops, supplies of oil field equipment, roads, and transportation facilities for development of the fields. However, there must also be adequate housing and provision for food. An adequate water supply is established, usually through drilling of water wells and installation of storage tanks and distribution systems making running water available throughout the camp area, both for household use and for fire protection. The water is filtered and chemically treated to make it safe for human use, and is subject to regular, periodic









1. Classroom in Concordia school, western Venezuela.

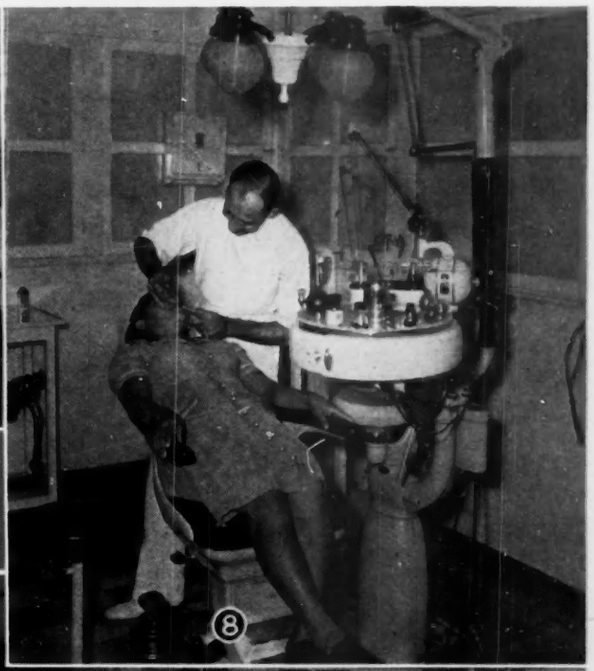
2. Sewing class in school maintained by Creole at Carapito, eastern Venezuela.

3. General view of hospital at Lagunillas, maintained jointly by Creole, Mene Grande, and Venezuelan Oil Concessions (Shell group).

4. Church for Venezuelan workers built by Creole, Mene Grande, and V.O.C. in Lake Maracaibo area.

5. Recreation field and stadium erected for use in directed recreational and sports program.

6. At none of the company installations is it necessary for the workers to use this type of laundry facilities. Facilities are furnished in the homes and in addition most camps have modern steam laundries. This scene is within three miles of one of the large oil fields.



7. Operating room in Mene Grande hospital at Cabimas on Lake Maracaibo.

8. Dental work is also a regular part of the medical attention furnished by American companies to employes.

9. Workers' club at San Tome, one of the largest camps in Venezuela. The club has all facilities for social life and recreation.

10. Adult class which has completed fourth grade work in Mene Grande school in western Venezuela.

11. Agricultural project at school in Carapito oil camp.

12. Housing for oil workers, Carapito camp.

Typical construction in town outside the limits of an oil company camp. Ten thousand persons live in this town, which uses purified water furnished by the oil company.

analysis so its standard is maintained.

Residences are provided for all workmen and their families. Most of the nationals employed by oil companies at their fields are recruited from the surrounding territory, and living quarters are provided which, almost without exception, are far better than the homes to which they have been accustomed. Modern in every respect, they contain living room, bed room, kitchen, bath and laundry facilities. They are equipped with electric lights and plumbing. Several types of house are in use, so that all types of families are provided for. Some companies favor single-family homes, others use many duplex houses, and in many instances both types are built in one camp. Construction, depending on locality, may be of hollow concrete tile or brick, with tile or cement floors and tile or asbestos roofing.

With proper housing disposed of, recreation fields are constructed for playing games such as baseball, softball, football and tennis. Clubs for amusement and recreation are equipped with projection machinery for showing of motion pictures which are a regular feature in all camps, billiard tables and accessories, etc.

In one camp taken as an example there are 59 Americans and 1387 Venezuelans on the payroll. First-aid stations, clinics, and full-scale hospitals are built at all camps at company expense and are staffed with physicians and nurses. Not only the employe, but every member of his family is entitled to and receives expert medical attention. This includes full hospitalization, and is free of cost to the employe. Hospitals have everything to be found in a modern hospital in the United States, including private rooms in addition to the wards, maternity wards, operating rooms, X-ray equipment, complete bacteriological and pathological laboratories, isolation wards, sanitary kitchens presided over by dietitians, and every adjunct of a modern up-to-date hospital.

Employes' Health Guarded

Complete health records are kept on all employes and their families from the original physical examination at time of employment, through all periodic examinations and checkups, showing all treatments administered during the course of their affiliation with the company. Formerly such medical care was never at the command of more than an extremely small percentage of the population of the country.

Educational facilities are provided for the oil worker and his children. Schools are built which provide elementary education for all children from beginners through the sixth grade. The company employs all of the teachers and the schools are subject to approval of the national educational system. The courses include everything which is available to children in the United States. In addition to the regular academic work, classes are conducted in home economics, manual training, handicraft, and business courses. The educational advantages are not confined to the children alone. Most companies maintain instructors for classes of grown-ups and have found them to be of inestimable benefit in increasing their value.

The educational program goes much further than mere elementary education. Workmen are given every opportunity for advancement, with the result that a large number of Venezuelans hold technical positions of responsibility in American oil companies. The companies offer scholarships to children of workers and other students who show promise in academic training, scholarships to colleges in the United States and in their own country. One of the largest operators in the country has native Venezuelans at the heads of its petroleum engineering and geological departments. An idea of the extent of this program may be gained by a list of students receiving training under this plan in one company alone. This company operates almost entirely in Western Venezuela and is not the largest producer.

In the United States:

- One student specializing in geology.
- One student specializing in mechanical and electrical engineering.
- Two students specializing in mechanical engineering.

In Venezuela:

- Nine civil engineering students in the Central University, Caracas.
- One civil engineering student in the University of the Andes at Merida.
- Six specializing in geology at Caracas School of Geology.
- Two girls in Caracas School for Nurses.
- One student in Normal School for Teachers in Maracaibo.
- One student taking pre-medical course at San Cristobal, prior to entering the University of Las Andes Medical School.
- One preparatory student at Caracas who will enter the Civil Engineering school of the Central University of Caracas.
- One student in the Nautical School at Maracaibo who should become a deck officer in the marine department.
- Fifty students in the Technical and Industrial School in Caracas.

Thought also has been given to the spiritual life of its people, and churches have been constructed. The companies bear all expenses, including those of the priest.

The government is seeking to raise the living standards of its people, and has instituted a program of technical training for the various industries with particular emphasis on oil. It will be found that the oil companies are working along the same lines with its employes and in most instances exceed actual government requirements. They do not merely emphasize efficiency in the work itself, but have concerned themselves with seeing that all of their people have the added advantages of proper living conditions.

20,000 Workers

Approximately 20,000 people are on payrolls of companies engaged in the business of finding, producing, and marketing oil in Venezuela. This is the number actually working. Approximately 90 percent, or 18,000 of these are Venezuelan nationals, and they together with their families, form a group of approximately 45,000 to 50,000 people directly affected and cared for by oil companies. This number is continually growing and increasing in health, educational and cultural position to the point where oil workers, as a class, form a nucleus which should have a profound effect on the nation's social structure.

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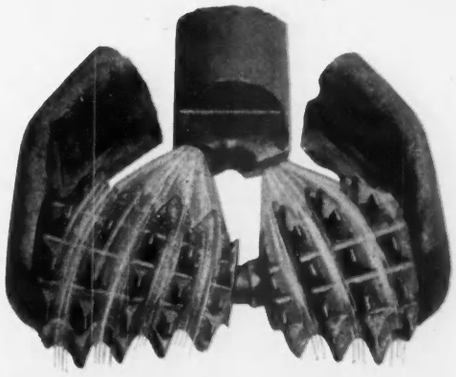
Save on your rig maintenance costs — all the way down — with Reed Rock Bits and less weight.

Unitized for Greater Strength

The replaceable slush nozzle will give . . .

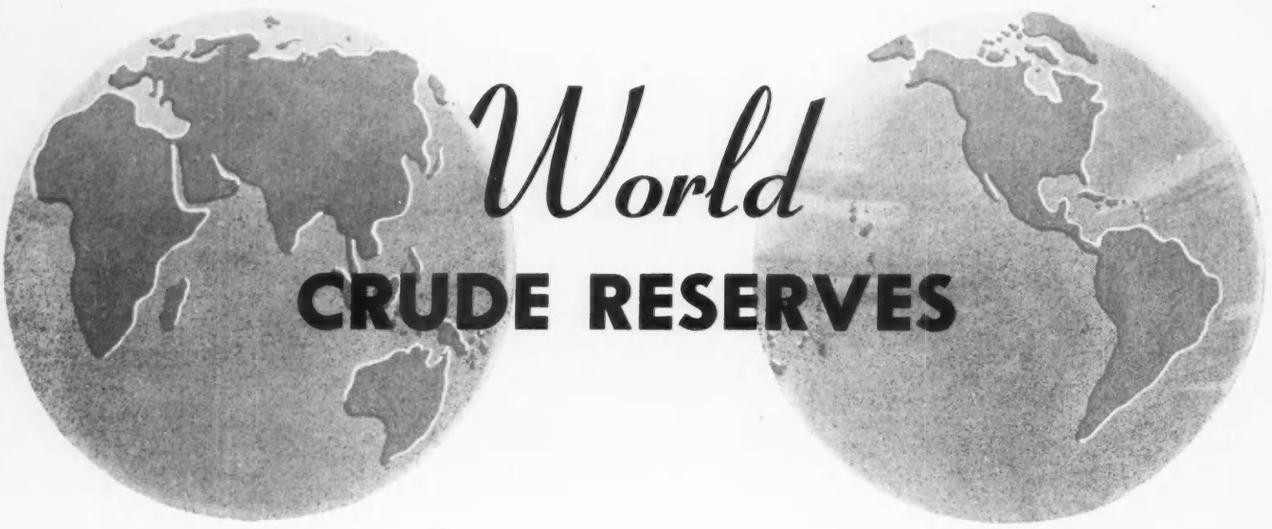
Thorough cleaning action on the gauge cutters.



Thorough cleaning action on cross roller cutters.

ROLLER BIT COMPANY

HOUSTON, TEXAS



World CRUDE RESERVES

By L. J. LOGAN, Associate Editor

OUT of World War II came greatly increased interest in the location and control of the proved and prospective petroleum reserves of the earth. For it was demonstrated that in this era, petroleum is a basic necessity, in both war and peace. In the future petroleum conceivably may be gradually replaced by other materials and other sources of energy. But that is a possibility which is of only minor importance to the present generation.

As of January 1, 1946, the proved world reserves of crude petroleum totaled approximately 58,911,813,000 barrels, as set forth in an accompanying table showing location by countries.

That is substantially more known future supply than the 49,329,171,000 barrels actually produced during the whole past history of the petroleum industry, extending back over almost a century. It means that 54 percent of all petroleum reserves discovered up to the present remain available to be produced in the future.

It should be hastily added, of course, that reserves ought not to be thought of in terms of past consumption or even wholy in terms of recent and current consumption but partially in terms of the still greater usage indicated for the future.

Abundant Reserves

However, projections into the future become increasingly meaningless as the time of consideration is advanced, because of the unknown elements in both oil discovery and usage of oil. The practical viewpoint, therefore, is to consider the present known reserves in relation to recent consumption and indicated consumption in the years immediately ahead.

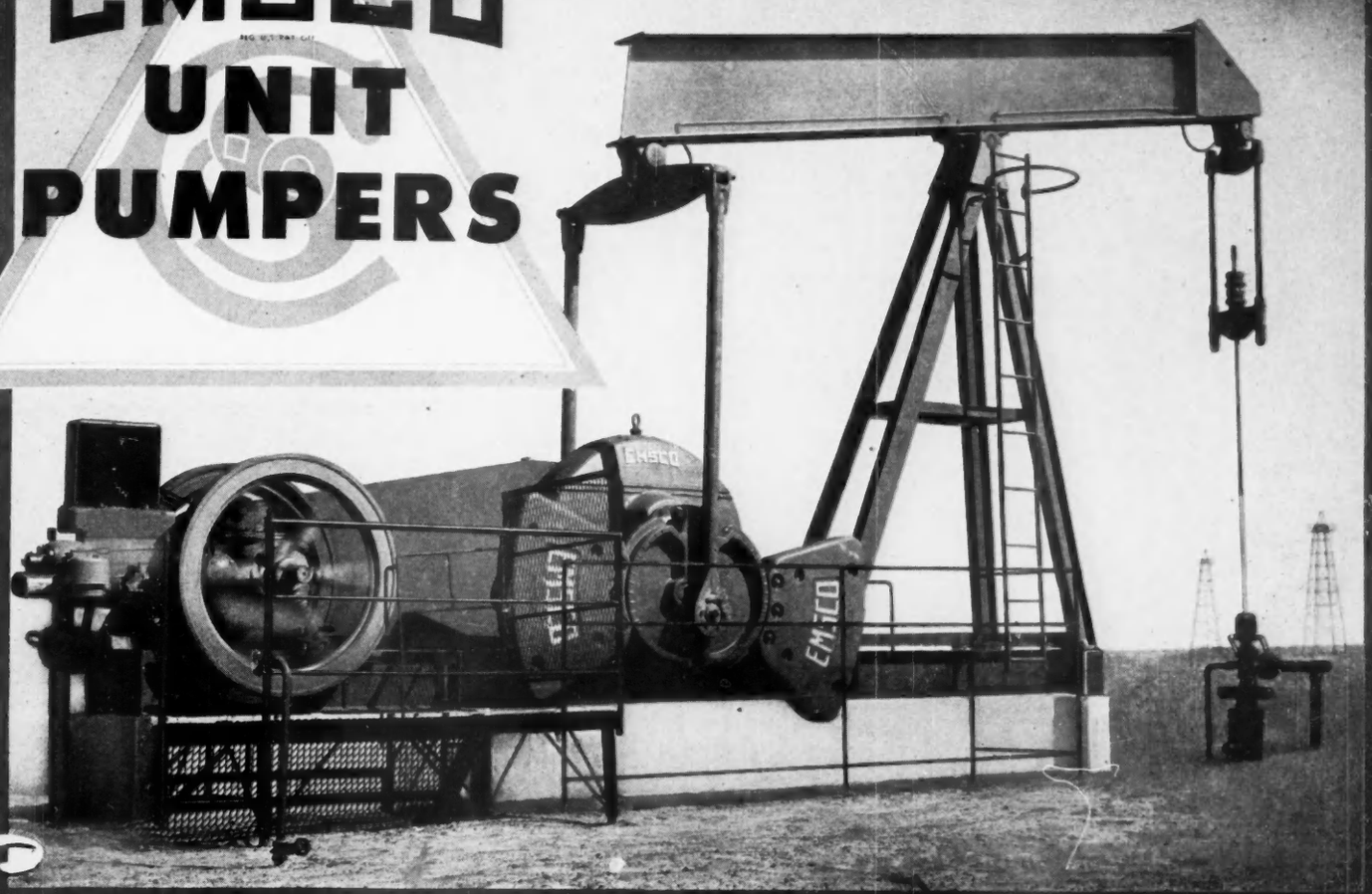
Considered from this standpoint, the present situation regarding petroleum reserves is generally satisfactory for the world as a whole, especially if there be added to it some assurance of lasting world peace and some assurance of success in present international moves toward more free world trade and a minimum of restrictions on a free world economy. In other words, nature has provided and man has available today a reserve of petroleum which is reasonably ample to meet the foreseeable consumption requirements of the peoples of the world. Furthermore, despite the substantial cumulated discoveries heretofore, the world as a whole faces relatively bright possibilities for future discoveries. Up to now, there is no ground for serious anxiety as to the possibilities for future discoveries equaling future requirements. On the contrary, there is much reason to expect that for a good many years to come, new discoveries will easily equal or exceed the concurrent withdrawals from established reserves.

This view that present world reserves are well in line with consumption trend is based on the fact that the 58,911,813,000 barrels of known unproduced petroleum is equivalent to 20 years' production at the 1945 rate of 2,783,021 barrels annually. Based on the reserve position normally maintained in the United States, principal producing country, this is in fact an unusualy large world reserve. The United States, segregated from the rest of the world, now has within its borders a reserve of 20,826,813,000 barrels, equivalent to only 12.2 years of production at the 1945 rate of 1,711,103,000 barrels anually. This is a somewhat subnormal position for the U. S., where reserves have ranged at times up to 18 years' supply and where the average over recent years has been around 14 years' supply. The present position of the world as a whole on reserves is therefore better than the best heretofore held by the U. S.

Nature has provided a petroleum reserve that will be ample to meet the world's needs for any foreseeable time.

The above statement that in the future, world discoveries should easily match or exceed world production is based on the generally accepted favorable outlook for future discoveries in several regions. Foremost among these regions is the Middle East, particularly around the Persian Gulf. In the table herewith, Iran, Iraq, Kuwait, Saudi Arabia, Bahrein Island, and Qatar are credited with 18½ billion barrels of reserves—nearly as much as the United States. But this is a conservative figure, representing reserves actually proved by drilling. There is every indication that this figure could be readily increased by billions of barrels with only limited drilling. In fact, on the basis of the opinion of the United States Technical Oil Mission to the Middle East (the

EMSCO UNIT PUMPERS



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▲ Emsco Unit Pumpers are equipped with adjustable wing type counterbalances, offering easy and accurate adjustment.* Any position between zero and maximum counterbalance effect is provided. Emsco Unit Pumpers are shipped with weights attached to crank.

▲ Emsco Unit Pumpers are roller bearing equipped throughout and are provided with herringbone gears.

*(DC-38 is equipped with Beam Balances.)

SPECIFICATIONS	DC-38	DD-58-R	DD-77	DA-114	SA-160	SA-228
API Peak Torque Rating at 20 spm. in. lbs.	38,400	58,000	77,300	114,000	160,000	228,000
API Polish Rod Capacity of Walking Beam	8,300	10,400	12,800	14,300	21,200	24,200
Maximum Counterbalance Effect at Maximum Stroke lbs.	4,530 (Beam Balance only)	5,500	6,700	8,200	11,500	15,000
Length Stroke Available	23, 28 33	24, 34, 44	28, 38, 48	34, 44, 54	34, 44, 54	34, 44, 54, 64
Net Weight (approximate)	5,300	7,926	10,600	14,270	19,750	26.320

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DeGolyer mission) as published in the American Association of Petroleum Geologists' Bulletin for July, 1944, the above estimate of 18½ billion barrels for the Middle East may reasonably be increased by at least 10 billion barrels by including, along with the reserves proved by developed fields, the reserves indicated by fields discovered but not yet fully explored. With the herewith tabulated 58,911,813,000 barrels of present proved world reserves as a starting point, therefore, it is indicated that world discoveries could be made to equal world production every year for at least a good part of a decade, merely by exploratory drilling in the Middle East region alone.

The very great possibilities for future discoveries in the Middle East were pointed out in a few sentences in the report of the DeGolyer mission. "When one considers the great oil discoveries which have resulted from the meager exploration thus far accomplished in the Middle East, the substantial number of known prospects not yet drilled, and the great areas still practically unexplored," stated the report, "the conclusion is inescapable that reserves of great magnitude remain to be discovered. The proved and indicated reserves of this area are comparable with those of the United States, yet all of the Middle East reserves have been discovered by the drilling of less than a total of 150 wildcat wells. In the United States we drill more than 20 times this number of wildcat wells each year.

"It is the opinion of this mission that, given reasonable time and a very moderate amount of oil field material, any single one of these four groups [of companies or combinations of companies in the Middle East] can develop and maintain within its own properties sufficient production to supply world requirements from the Middle East area for many years to come. For the next ten to 15 years at least, the Middle East area is likely to develop and maintain productive capacity of as much as four times its probable market outlet."

As to the future possibilities, the DeGolyer mission implied that the limitations for the different countries are more a matter of area than of varying conditions. The rating of undrilled prospect values placed Iran and Saudi Arabia in competition for first place, Iraq a close third, Qatar a somewhat distant fourth, and Kuwait a definitely distant fifth.

The Middle East definitely ranks foremost among all the regions of the world in the possibilities offered for future discoveries. Among those who have given it that rating are G. C. Gester, Standard Oil Company of California, and Ernest O. Thompson, Texas Railroad Commission member, whose appraisals of the possibilities by countries are herewith published. Gester uses six classifications, and his No. 1 class is monopolized by the countries of the Middle East with the exception of Russia, which also is placed in that first order of speculative possibilities. In his second most promising group, Gester includes only the United States, Venezuela, and Netherlands India. His third

Proved World Petroleum Reserves by Countries of Location and by Financial Control

COUNTRY	Estimated Proved Reserves Jan. 1, 1946 (Thousands of Barrels)	Ownership in Nationals of			Reserves (Col. 1) as Percent of World Total	Production in 1945 (Thousands of Barrels)	Production in 1945 (Col. 4) as Percent of World Total	Cumulated Production to Jan. 1, 1946 (Thousands of Barrles)	Cumulated Production (Col. 6) as Percent of World Total	Cumulated Discoveries (Col. 1 Plus Col. 6)	Cumulated Discoveries (Col. 8) as Percent of World Total
		Nation	Percent	Thousands of Barrels							
North America—											
Canada	150,000	British	60	90,000	0.25	8,275	0.30	113,329	0.23	263,329	0.24
		U. S. A.	40	60,000							
Mexico	870,000	Mexico	100	870,000	1.48	41,975	1.51	2,183,786	4.43	3,053,786	2.82
Trinidad	300,000	British	100	300,000	0.51	21,500	0.77	313,579	0.64	613,579	0.57
United States	20,826,813	U. S. A.	96	19,993,740	35.35	1,711,103	61.48	31,489,760	63.84	52,316,573	48.33
		British	4	833,073							
Other North America	3,000	Cuba	100	3,000	0.01	150	0.01	1,275	0.00	4,275	0.01
Total North America	22,149,813	U. S. A.	90.53	20,053,740	37.60	1,783,003	64.07	34,101,729	69.14	56,251,542	51.97
		British	5.52	1,223,073							
		Mexico	3.93	870,000							
		Miscellaneous	0.00	3,000							
South America—											
Argentina	300,000	Argentina	75	225,000	0.51	22,880	0.82	346,043	0.70	646,043	0.60
		British	20	60,000							
		U. S. A.	5	15,000							
Bolivia	50,000	Bolivia	100	50,000	0.09	406	0.02	3,112	0.01	53,112	0.05
Brazil	1,000	Brazil	100	1,000	0.00	79	0.00	275	0.00	1,275	0.00
Colombia	500,000	U. S. A.	85	425,000	0.85	22,866	0.82	370,946	0.75	870,946	0.80
		British	15	75,000							
Ecuador	25,000	Ecuador	10	2,500	0.04	2,664	0.10	36,601	0.07	61,601	0.06
		British	90	22,500							
Peru	160,000	British	30	48,000	0.27	13,747	0.49	332,386	0.68	492,386	0.46
		U. S. A.	70	112,000							
Venezuela	7,000,000	U. S. A.	80	5,600,000	11.88	321,902	11.57	3,206,987	6.50	10,206,987	9.43
		British	20	1,400,000							
Total South America	8,036,000	U. S. A.	76.55	6,152,000	13.64	384,544	13.82	4,296,350	8.71	12,332,350	11.40
		British	19.98	1,605,500							
		Miscellaneous	3.47	278,500							
Europe—											
Albania	25,000	Albania	100	25,000	0.04	750	0.03	9,198	0.02	34,198	0.03
Czechoslovakia	3,500	Czechoslovakia	100	3,500	0.01	175	0.01	3,615	0.01	7,115	0.01
England	15,000	British	100	15,000	0.03	800	0.03	2,495	0.01	17,495	0.02
France	10,000	France	100	10,000	0.02	500	0.02	13,743	0.03	23,743	0.02
Germany	85,000	Germany	100	85,000	0.14	7,000	0.25	80,395	0.16	165,395	0.15
Austria	75,000	Miscellaneous	100	75,000	0.13	7,350	0.26	35,828	0.07	110,828	0.10
Hungary	75,000	U. S. A.	100	75,000	0.13	5,019	0.18	34,255	0.07	109,255	0.10
Italy	1,500	Italy	100	1,500	0.00	75	0.00	3,146	0.01	4,646	0.00
Poland	50,000	Poland	50	25,000	0.08	3,000	0.11	279,014	0.56	329,014	0.30
		U. S. S. R.	50	25,000							
		British	40	200,000							
		Roumania	20	100,000							
Roumania	500,000	U. S. A.	13	65,000	0.85	34,010	1.22	1,095,366	2.22	1,595,366	1.48
		France	11	55,000							
		Miscellaneous	16	80,000							
U. S. S. R.	8,000,000	U. S. S. R.	100	8,000,000	13.58	300,000	10.78	5,646,759	11.44	13,646,759	12.61
Other Europe	150	Miscellaneous	100	150	0.00	10	0.00	86	0.00	236	0.00
Total Europe	8,840,150	U. S. S. R.	90.78	8,025,000	15.01	358,689	12.89	7,203,900	14.60	16,044,050	14.82
		British	2.43	215,000							
		U. S. A.	1.58	140,000							
		France	0.74	65,000							
		Miscellaneous	4.47	395,150							

(Table continued on page 24)

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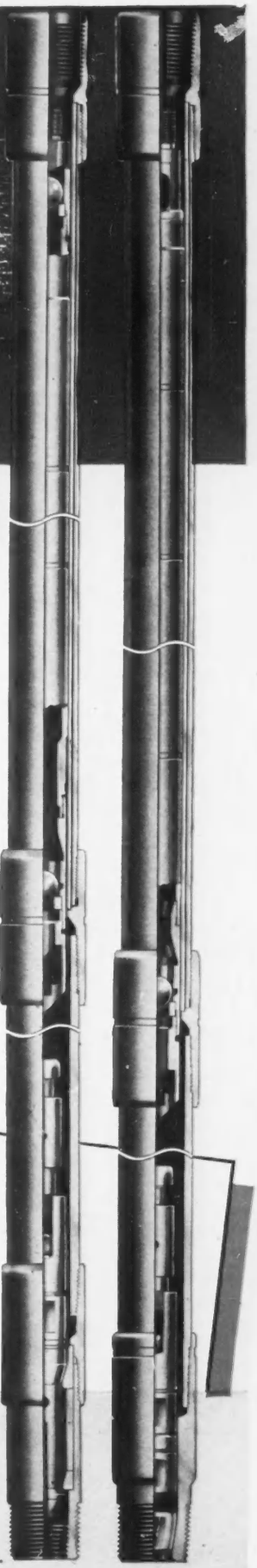
TUBING "FULL LINER" PUMPS



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THE OILMASTER TUBING "FULL LINER" PUMP is similar in construction to the conventional type, sectional liner tubing pump, the difference being in the substitution of a ONE PIECE ALLOY STEEL LINER for the sections normally used in a Tubing Pump.

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THE OILMASTER TUBING "FULL LINER" PUMP is made in two standard types, Type "P" and Type "F." Both types are of the same general design, the difference being in the plunger and parts accessory groups. Type "P" incorporates the heavy duty pin end plunger and upset box end extension nipple. Type "F" standard assemblies include the conventional box end plunger and non upset extension nipple.

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group includes Mexico and Colombia.

Roughly, those first three of the six classes of Gester are equivalent to the first two of Thompson's four classes. A variation between the two appraisers is that Thompson breaks the U. S. and Russia down into component districts and Thompson also includes some "wildcat" countries. In general, Thompson's ratings agree with those of Gester, although Thompson includes in his first two groups Canada, Peru, and Roumania, which Gester rates lesser than his first three groups.

In his No. 4 class, Gester includes Canada, Ecuador, Argentina, Bolivia, Austria, Hungary, Roumania, and Egypt. This classification corresponds roughly to Thompson's third or "Locally Important" rating, in which Thompson places Ecuador, Argentina, Bolivia, Germany, Hungary, Poland, Egypt, and India-Burma.

Gester's No. 5 and No. 6 classes are about equivalent to Thompson's final "Small" category. These lowest ratings are given to Brazil, Trinidad, Albania, Czechoslovakia, England, France, Italy, Turkey, Palestine, Sarawak and Brunei, China, and Japan. By means of his breakdowns by U. S. and Russian districts. Thompson gives the Gulf Coast and Mid-Continent top rating and in the case of Russia gives top rating to the Baku, North Caucasus, Perm basin, and Turkaman regions, while placing in second place the Emba, East Ural, Sakhalin, and Tadjikstan and Khirgez regions.

In review of the above data, it may be said that in general, the best possibilities for future discoveries are offered in the countries which rank highest at present in proved reserves.

Distribution of Reserves

While the world reserves of petroleum are ample to meet requirements, they also are distributed fairly advantageously, despite the fact that some individual countries, particularly those of relatively small area, are deficient in this resource. In the first place, it is noteworthy that the present world reserves are divided almost exactly 50-50 between the Western and Eastern Hemispheres. Of the 58,911,813,000 barrels world total, North and South America have 51.24 percent, while Europe, Africa, and Asia have nearly that proportion. By making only slightly higher allowances for the Middle East, the ratio would be exactly half and half.

In the second place, advantage arises out of the fact that in both hemispheres the richest reserves are fortunately readily accessible to tidewater without excessive need for pipe lines. In the previously mentioned article by Gester, these two diametrically opposite oil rich centers are shown on a map as the East Pole (Persian Gulf-Caspian Sea) region, and the West Pole (Caribbean-Gulf) region. The reserves of the former are advantageously located for supplying Europe, Africa, and Asia, and those of the latter for supplying North and South America.

Under proper political and economic conditions, the world's oil should be readily and economically available to all

Proved World Petroleum Reserves by Countries of Location and by Financial Control—*Continued*

COUNTRY	Estimated Proved Reserves Jan. 1, 1946 (Thousands of Barrels)	Ownership in Nationals of			Reserves (Col. 1) as Percent of World Total	Production in 1945 (Thousands of Barrels)	Production in 1945 (Col. 4) as Percent of World Total	Cumulated Production to Jan. 1, 1946 (Thousands of Barrles)	Cumulated Production (Col. 6) as Percent of World Total	Cumulated Discoveries (Col. 1 Plus Col. 6)	Cumulated Discoveries (Col. 8) as Percent of World Total
		Nation	Percent	Thousands of Barrles							
Africa—											
Egypt	75,000	British	100	75,000	0.13	9,500	0.34	89,213	0.18	164,213	0.15
Algeria	.....	.....	.....	.....	.....	.....	.....	143	0.00	143	0.00
Other Africa	500	Miscellaneous	100	500	0.00	25	0.00	245	0.00	745	0.00
Total Africa	75,500	British	99.34	75,000	0.13	9,525	0.34	89,601	0.18	165,101	0.15
		Miscellaneous	0.66	500							
Asia—											
Near East:											
Iran	6,000,000	British	100	6,000,000	10.19	140,525	5.05	1,459,501	2.96	7,459,501	6.89
Iraq	4,750,000	British	52.50	2,493,750	8.06	31,845	1.14	307,370	0.62	5,057,370	4.67
		France	23.75	1,128,125							
		U. S. A.	23.75	1,128,125							
Kuwait	4,000,000	British	50	2,000,000	6.79	.....	.....	.....	.....	4,000,000	3.70
		U. S. A.	50	2,000,000							
Saudi Arabia	3,000,000	U. S. A.	100	3,000,000	5.09	21,311	0.77	54,841	0.11	3,054,841	2.82
Bahrein Island	250,000	U. S. A.	100	250,000	0.42	7,309	0.26	71,461	0.15	321,461	0.30
Qatar	500,000	British	52.50	262,500	0.85	.....	.....	.....	.....	500,00	0.46
		France	23.75	118,750							
		U. S. A.	23.75	118,750							
Total Near East	18,500,000	British	58.14	10,756,250	31.40	200,990	7.22	1,893,173	3.84	20,393,173	18.84
		U. S. A.	35.12	6,496,875							
		France	6.74	1,246,875							
Far East:											
Burma	100,000	British	100	100,000	0.17	750	0.02	328,692	0.66	463,692	0.43
India	35,000	British	100	35,000	0.06	2,500	0.09				
China	15,000	China	100	15,000	0.03	500	0.02	1,892	0.00	16,892	0.02
Japan	35,000	Japan	100	35,000	0.06	2,500	0.09	97,509	0.20	132,509	0.12
Sakhalin	50,000	U. S. S. R.	100	50,000	0.08	5,000	0.18	59,240	0.12	109,240	0.10
Sarawak and Brunei	75,000	British	100	75,000	0.13	5,000	0.18	126,532	0.26	201,532	0.18
Netherlands India	1,000,000	British-Dutch	61	610,000	1.69	30,000	1.08	1,129,391	2.29	2,129,391	1.97
		U. S. A.	39	390,000							
Total Far East	1,310,000	British-Dutch	62.59	820,000	2.22	46,250	1.66	1,743,256	3.53	3,053,256	2.82
		U. S. A.	29.77	390,000							
		U. S. S. R.	3.82	50,000							
		Miscellaneous	3.82	50,000							
Other Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total Asia	19,810,000	British-Dutch	58.44	11,576,250	33.62	247,240	8.88	3,636,429	7.37	23,446,429	21.66
		U. S. A.	34.76	6,886,875							
		France	6.30	1,246,875							
		U. S. S. R.	0.25	50,000							
		Miscellaneous	0.25	50,000							
Australia-New Zealand	100	British	100	100	0.00	5	0.00	45	0.00	145	0.00
World Undistributed	250	Miscellaneous	100	250	0.00	15	0.00	1,117	0.00	1,367	0.00
Total World	58,911,813	U. S. A.	56.41	33,232,615	100.00	2,783,021	100.00	49,329,171	100.00	108,240,984	100.00
		British-Dutch	24.94	14,694,923							
		U. S. S. R.	13.71	8,075,000							
		France	2.23	1,311,875							
		Mexico	1.48	870,000							
		Miscellaneous	1.23	727,400							

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The Hunt Wire Line Core Barrel has fewer parts and threaded connections, by far, than any other wire line barrel. This means less inventory requirements, more economical operation and greater dependability. Check it on your next job . . . and let the Hunt Wire Line Core Barrel check the job for you.

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peoples. And if this possibility of free usage of petroleum were unshackled from political restrictions, through international cooperation, the petroleum industry would thoroughly spread its activities and benefits over the earth and do very much to promote high standards of living everywhere.

While world reserves are well distributed geographically, their distribution among individual countries is such as to rule out nationalism as a sound viewpoint for considering reserves. Nature simply did not take into account the national boundaries which now exist when it provided accumulations of petroleum. Many countries are deficient in oil and some have much more than they need but which they can exchange for needed materials and goods, just as some countries advantageously produce much more cotton, wheat, cattle, rubber, tin, copper, or other commodities than they need. Only a few countries, such as Russia, Mexico, and the United States, are more or less in balance as between petroleum supply and demand, and the U. S. possibly may become henceforth a net importer of oil, as she now holds within the 48 states only 35.35 percent of world reserves (including the limited British holdings in the U. S.), while producing 61.48 percent of world production. Even when foreign reserves of U. S. companies are included, the U. S. holds but 56.41 percent of world reserves (33.94 percent being within the country and 22.47 percent in foreign countries), although producing and using nearly ⅔ of the world totals of production and consumption.

Possibilities for Discovering New Petroleum Reserves, by Countries (Second column shows "Order of Speculative Possibilities")

COUNTRY	Evaluation by Ernest O. Thompson[1]	Evaluation by G. C. Gester[2]
North America:		
United States		II
Gulf Coast	Very Great	....
Mid-Continent (incl. W. Tex. and N. Mex.)	Very Great	....
Rocky Mountains	Large	....
California	Large	....
Eastern	Locally Important	....
Mexico	Large	III
Canada	Large	IV
Central America	Small	....
South America		IV
Venezuela	Very Great	II
Colombia	Very Great	III
Peru	Large	VI
Ecuador	Locally Important	IV
Paraguay	Locally Import't (?)	....
Chile	Small	....
Argentina	Locally Important	IV
Bolivia	Locally Important	IV
Brazil	Small	....
Trinidad	....	VI
Europe:		
Albania	Small	V
Austria	....	IV
Czechoslovakia	Small	V
Denmark	Small	....
England	Small	....
Esthonia	Small	....
France	Small	....
Germany	Locally Important	V
Hungary	Locally Important	IV
Italy	Small	V
Poland	Locally Important	V
Roumania	Large	IV
Russia	....	I
Baku Region	Very Great	....
North Caucasus	Very Great	....
Perm Basin	Very Great	....
Emba Region	Large	....
Spain	Small	....
Africa:		
Egypt	Locally Important	IV
Mozambique	Small	....
Angola	Small	....
French North Africa	Small	....
Madagascar	Small	....
Asia:		
Russia:		
East Ural	Large	....
Sakhalin	Large	....
North Artic	Locally Important	....
Turkmen Region	Very Great	....
Tadjikstan and Khirgez	Large	....
Iraq	Very Great	I
Iran	Very Great	I
Bahrein Island	Locally Important	
Kuwait	Large	
Qatar	Large	I
Saudi Arabia	Very Great	
Syria	Locally Important	....
Turkey	Small	....
Palestine	Small	....
Afghanistan	Locally Important	....
India	Locally Important	V
Burma	Locally Important	
Netherlands Indies	Large	II
Sarawak and Brunei	....	VI
China	Small	VI
Japan	Small	VI
Australia	Small	....

[1] Member of Texas Railroad Commission. Data embodied in paper on "World Petroleum and Its Availability" presented at Fort Worth, October 25, 1943, before National Stripper Well Association; also used in several subsequent papers. Does not consider present discovered reserves.

[2] Geologist, Standard Oil Company of California. Data shown in paper on "World Petroleum Reserves and Petroleum Statistics," Bulletin of American Association of Petroleum Geologists, October, 1944.

Leader in oil development not only at home but also all over the world, United States capital controls 33,232,615,000 barrels of reserves out of the world total of 58,911,813,000 barrels, a ratio of 56.41 percent. The magnitude of the domestic industry is of course an important factor in this percentage figure, but through the same initiative and enterprise which built a great industry at home, U. S. companies have spread similar development all over the globe, now having important holdings in South America, Europe, Asia, and the East Indies. Those foreign holdings include 13,238,875,000 barrels of petroleum reserves, or 22.47 percent of the world total. They include 6,152,000,000 barrels in South America, 6,496,875,000 barrels in the Middle East, and some in Europe and Netherlands, India.

When the foreign holdings of U. S. companies are included as accessible for meeting U. S. requirements, the nation is fairly well in balance on supply and demand.

British, Dutch Holdings

British and Netherlands capital is the second leading factor in control of world reserves of petroleum, together holding 24.94 percent of world reserves. (Of this figure, about 5 percent is the Netherlands portion, and 20 percent British.) The British-Dutch world reserves of 14,694,923,000 barrels are predominantly in the Middle East, where 10,756,250,000 barrels are held, but include substantial reserves also in the Far East, the United States, and South America and some in Europe and Africa.

Russia ranks third in control of world reserves, and has the special advantage that all of her reserves are within her own borders. Russia is in fact in an exceptionally well balanced position regarding petroleum. Exclusive of Sakhalin the U.S.S.R. holds 13.58 percent of world reserves, and including Sakhalin 13.71 percent. Meanwhile, Russia is producing about 11 percent of the world total of production. The Russian proved reserves are estimated conservatively at 8 billion barrels, exclusive of Sakhalin, which is here conservatively estimated as holding 50 million barrels. Furthermore, as pointed out above, Russia has within her borders some of the world's most promising regions for the future discovery of new reserves. In seeking potential reserves in northern Iran, adjacent to her present Caspian Sea region reserves, Russia aims at bolstering an already favorable situation on petroleum reserves.

It is noteworthy that the "Big Three" in petroleum reserves are the same as the "Big Three" in the world's political and economic affairs. The United States, Great Britain, and the U.S.S.R. together control financially 95.06 percent of world reserves, including 56.41 percent by the U.S., 24.94 percent by the British (and Dutch), and 13.71 percent by the U.S.S.R. Adding to these nations France, to make the "Big Four," accounts for 97.29 percent of world petroleum reserves. For French capital owns 2.23 percent of world reserves (1,311,875,000 barrels), located largely in Iraq and Qatar. Mexico, frendly neighbor of the U.S., holds 1.48 percent of world proved reserves, on the basis of that government's estimate of 870 million barrels. This amount, added to the holdings of the "Big Four," accounts for 98.77 percent of world reserves. This leaves 1.23 percent of world reserves (727,400,000 barrels) under the financial control of various other countries.

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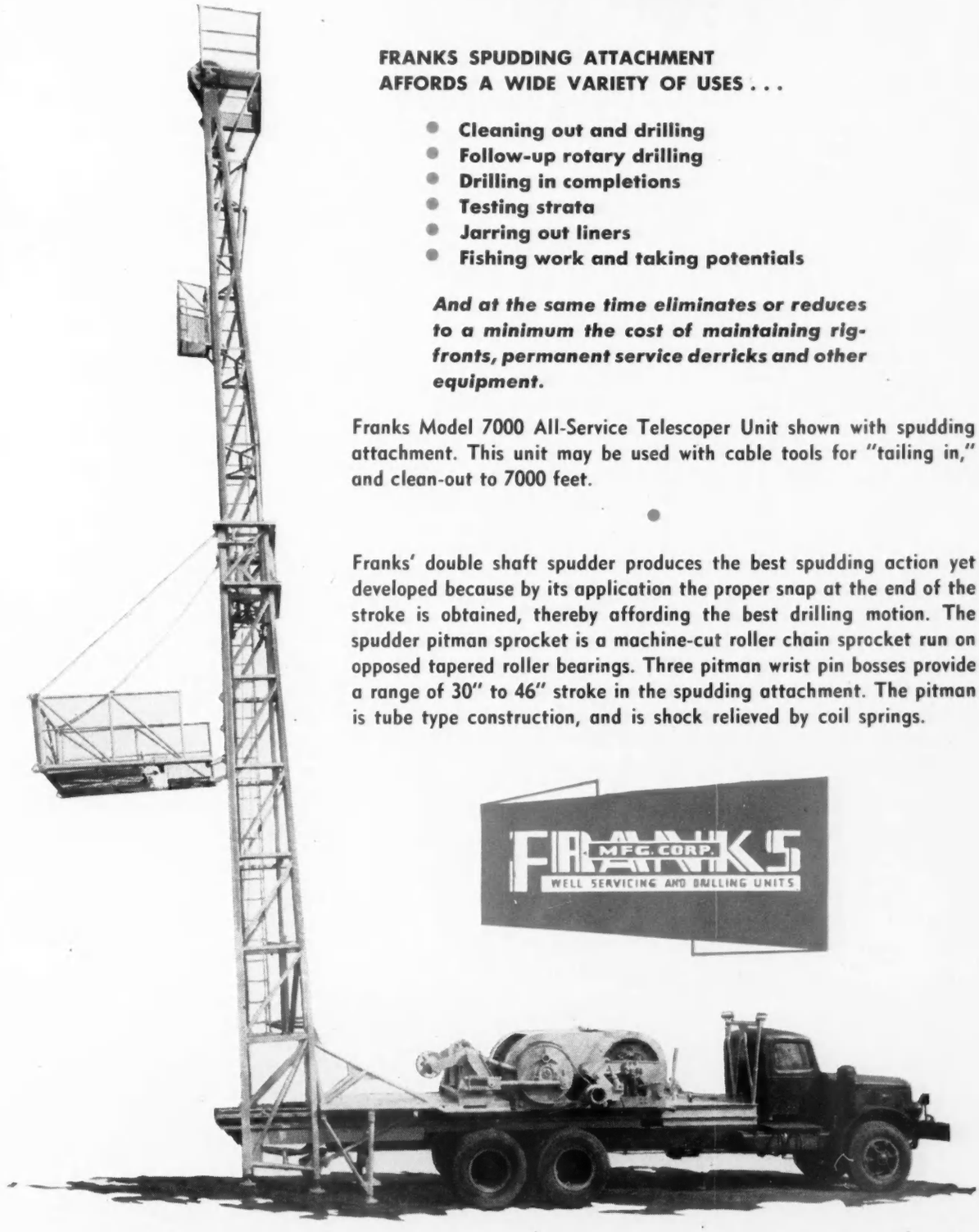

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Paraguay's First Wildcat To Spud in Soon

By GILBERT M. WILSON, Staff Writer

IN CONJUNCTION with its active program of geophysical exploration in the Chaco Territory, where Union Oil Company has a contract with the Republic of Paraguay, the company is moving in equipment preparatory to drilling the first test well in that country. Transportation and trans-shipment difficulties and shortages of materials, together with scarcity of water and lack of communications in the remote area are but a few of the problems that have confronted the company on this first attempt at oil exploration in Paraguay. The test well is scheduled to spud in about July 1.

Since January, 1945, the company has been conducting geophysical exploration in the Chaco where two crews now are operating. The area in which the geophysical parties are working is a semi-arid, sparsely inhabited region bounded on the west and north by the border with Bolivia, which was established by the boundary settlement following the bloody Chaco war between Paraguay and Bolivia. Much of this region was fought over and it is not uncommon for field men to uncover live ammunition and other grim mementoes of the battles that were fought in the area.

Shipping Problems

Initial shipments of roadworking, transportation, construction and drilling equipment, as well as supplies, are nearing completion; however, shipping shortages and strikes, both in the U. S. and in South American ports, have been hampering expected deliveries. First phase of the long line of communications involves the use of marine transportation from California, Gulf and East Coast ports to Buenos Aires and Montevideo. There cargo is trans-shipped to river boats and barges for the journey northward up the Rio Paraná and Rio Paraguay to Puerto Casado where transportation by land begins.

Although it has been possible to ship large cargoes directly by river barge from the ocean ports to Puerto Casado, many of the shipments are transferred from the larger ships that do not run beyond Asunción, capital and largest city of Paraguay, to smaller craft which ply the upper river. At Puerto Casado, shipments are transferred to a narrow-gauge railroad which extends westerly into the Chaco approximately 100 miles. From the railhead, company trucks take over the job of hauling equipment about 165 miles farther west over dirt roads to the camp and location. The company has reinforced the bridges on the road between the railhead and Mariscal Estigarribia (see map), the latter being the command headquarters of the Chaco military territory. Beyond this point, road-grading equipment has been working on the dirt road which runs across flat country to the drililng site.

A partial understanding of the magnitude of the undertaking involved in moving equipment into this remote area may be gained by realizing that the river journey from Buenos Aires to Puerto Casado is roughly equal to the river distance between New Orleans and Chicago. During low stages of water in the Rio Paraguay, many of the river boats and barges cannot be loaded to capacity, resulting in delay of shipments as well as increase in freight rates. Shipment time from U. S. ports to Puerto Casado, including time spent in trans-shipments, has averaged between 2½ and 3 months. Some shipments, delayed by labor tie-ups, have taken as long as four months. The company now has a sailing available approximately every 20 days from United States ports as compared with 40 to 50-day availability of ships during the early part of the year.

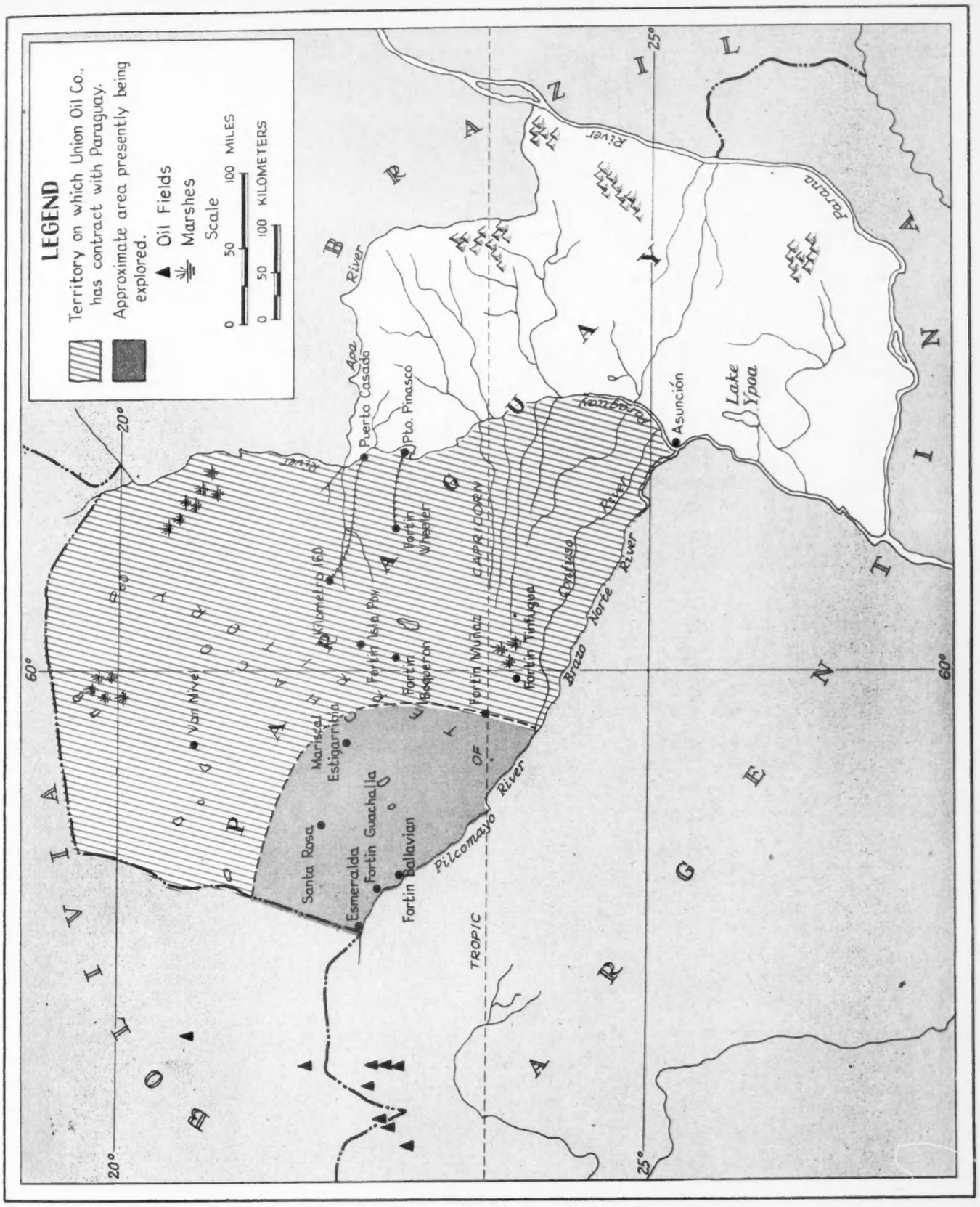
The Chaco Territory of Paraguay, on which Union Oil has the exploration and drilling rights under terms of the contract with the Paraguayan government, comprises 56 million acres, or an area equal to about half that of the state of California. The topography of the Chaco is predominently flat. Vegetation grades from the relatively well-watered easterly part of the semi-arid westerly region where thorny brush, narrow-leafed trees and cactus are characteristic.

One of the greatest single handicaps encountered by operating personnel has been the shortage of fresh water. Potable water in small amounts is obtained in some localities by drilling, but generally speaking, the sub-surface waters are salty or brackish. There are no perennial streams in the vicinity of the drilling camp. Some water has been impounded by a dam at the camp site, where several fresh water wells have been drilled. For emergency use, a water distillation plant is planned for treatment of brackish water. The few water holes and water wells in the region had a considerable influence on the fighting during the Chaco war. The country has a sub-tropical climate and has been termed one of the healthiest places in the world. Asunción, with a population of 100,000, lies as far south of the equator as Key West is north of the equator.

Labor supply is one of the problems encountered, since the only inhabitants of the undeveloped area of the Western Chaco are troops stationed at military outposts, and small roving bands of Indians. The principal settlements in the interior of the Chaco are Mariscal Estigarribia, center of the territorial military command, and Filadelphia, center of the Mennonite agricultural colonies where several thousand immigrants settled in 1926 and 1928. The company's policy is to employ Paraguayans insofar as possible and to utilize local products when available. An example of the latter is the portable houses for camp use which were manufactured in Asunción. In line with this policy of utilizing the country's resources is the interesting fact that the company should experience no shortage of quebracho, a substance used in conditioning drilling mud. Puerto Casado, on the Rio Paraguay, is one of the principal exporting centers for that material in South America.

Two-Way Radio Used

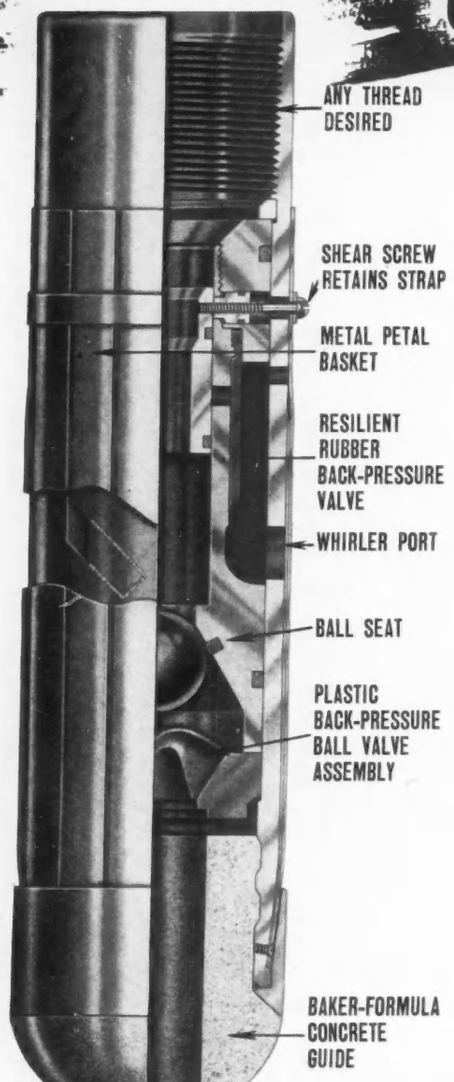
Company headquarters are located at Asunción, which also is headquarters for the geophysics company doing the exploratory work, as well as for the drilling contracting company which will do the actual drilling with Union Oil Company equipment. At present, two-



way radio and military telephone line are employed for communication between Ascunción and the several working parties and camps in the field. Travel between Asunción and several points in the Chaco is possible by local air lines, and increased use of air transportation is anticipated. Drilling equipment for this initial well will consist of a conventional derrick and drawworks powered with diesel prime movers.

It is expected that by early June all essential equipment should have arrived at the well site and that by July drilling operations will have started. This exploratory well, the first to be drilled in search of oil in Paraguay, is expected to furnish considerable geological information in a section of the country where formation outcrops are notably lacking.

HERE'S the NEW



This view shows the BAKER TRIPLEX Cementing Shoe in running-in position with the hold-down strap retaining the Metal Petal basket Assembly close against the shoe. This insures safe and easy running-in and permits free movement of the pipe up or down the hole before setting.–The time-tested Baker Plastic Ball Valve floats the casing safely down the hole.–The rounded nose of Baker-Formula Concrete guides the string past any side-wall irregularities.

WHAT IT WILL DO

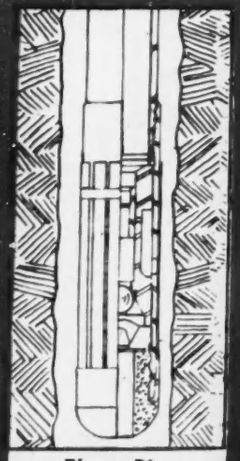
The Baker TRIPLEX Cementing Shoe basically is a casing shoe and operates as a conventional float shoe while running-in, washing and conditioning the hole. Its principal use is to retain all cement slurry *above the shoe*, thus protecting formations below from cement contamination.

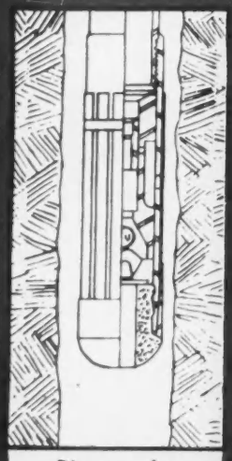
All cement slurry is directed upward through side Up-Whirler ports; a sleeve-type, back-pressure valve prevents any return flow of slurry. The Baker Metal Petal Basket is intended to form a bridge, thus preventing cement slurry from settling into permeable, low-pressure zones below. The Basket is indispensable in large-diameter, or irregular-shaped holes.

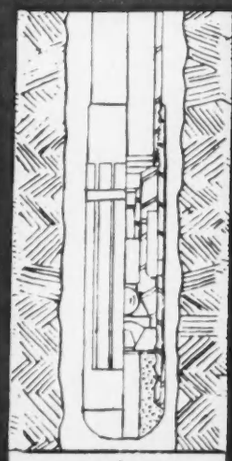
FAST, SAFE OPERATION

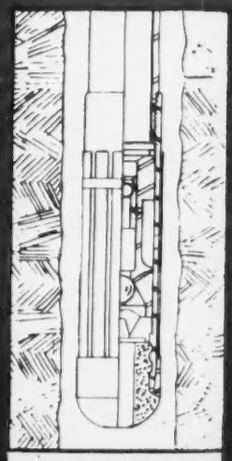
The Baker TRIPLEX Cementing Shoe is secured to the lower end of the casing and provides the advantages of all Baker FLOATING Equipment in safely guiding, floating and landing strings of casing of any size or length. The rounded nose of Baker-Formula Concrete guides the casing past any side-wall irregularities. The Baker PLASTIC Valve Assembly—with the buoyant Plastic ball that floats in cement slurry—maintains a constant, leakproof seal against either high or low pressure.

Then, after reaching the desired point in the hole, circulation is established through the ample interior passageways of the shoe, and the hole is conditioned preparatory to cementing. The Tripping Ball now is pumped (or allowed to gravitate) down the hole to seat upon the Tripping Valve. A pressure of 400 to 500 psi is applied to the casing which shears the screws in the Tripping Valve, permitting it to move downward and expose the cementing ports. Shearing


Floats Pipe


Pipe can be moved up


. . . or down to desired position


Trip Ball dropped and seated

BAKER Triplex CEMENTING SHOE

the screws also releases the hold-down strap around the basket, allowing the basket to expand outwardly against the wall of the hole. The cementing operation is then carried out in the conventional manner with all cement slurry directed upward and *held above the shoe* by the expanded Baker Metal Petal Basket.

STRONG, SIMPLE CONSTRUCTION

The Baker TRIPLEX Cementing Shoe consists of a whirler float shoe with a Baker Metal Petal Basket festened on the shoe below the cementing ports. All cement slurry is directed upward and retained above the shoe. A fabric reinforced, resilient rubber, sleeve-type back-pressure valve opens readily to permit passage of the slurry into the annulus above the shoe, but closes instantly to prevent any return flow of slurry.

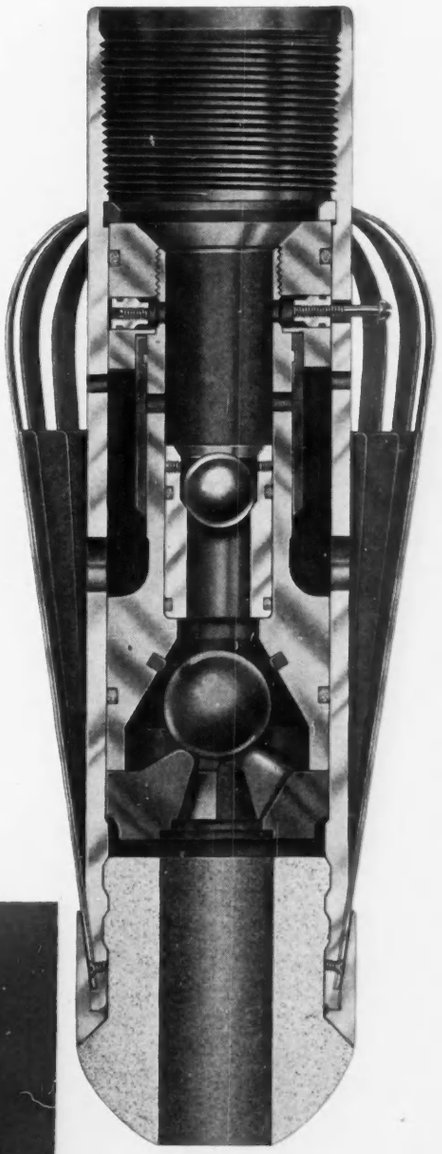
All internal parts are made of readily drillable materials. Two one-half inch set screws hold the inner assembly stationary to facilitate drilling out the shoe.

EASY TO ORDER AND USE

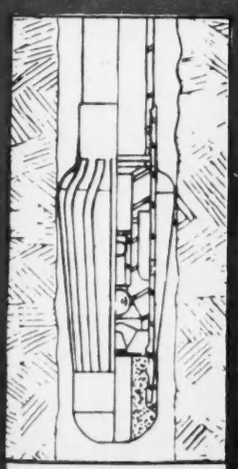
When ordering the Baker TRIPLEX Cementing Shoe it is necessary to give only the size, weight and thread specifications of the casing upon which it is to be run. It is advisable to furnish hole size, because (a) the TRIPLEX Shoe is approximately ½" larger than the O.D. of a standard casing coupling; and (b) the Metal Petal Basket must be of sufficient size to expand and pack-off even in large diameter and irregularly shaped holes.

The use of a Baker TRIPLEX Cementing Shoe is no problem to experienced cementers. Its effectiveness is evident from the demand from all active fields. Contact your nearest Baker office or representative.

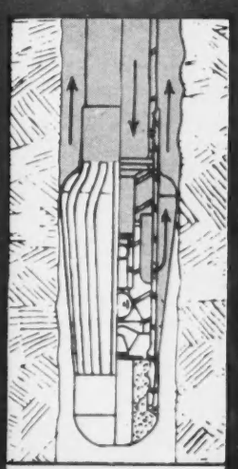
PACKS OFF IN LARGE DIAMETER, OR IRREGULARLY SHAPED HOLES, AND RETAINS CEMENT SLURRY ABOVE THE SHOE



After safely floating in the casing and moving it freely to condition the hole, the tripping ball is gravitated or pumped down, seating on top of the tripping valve. Pressure of 400 to 500 psi then shears the screws in the tripping valve which moves down and exposes the whirler cementing ports. Shearing the screws also releases the Baker Metal Petal Basket which expands against the side-walls and forms a bridge. Or, if the hole is irregular in shape, the Basket packs-off to fill the annular space and hold the cement slurry above the shoe.



Tripping Valve down, Basket expanded



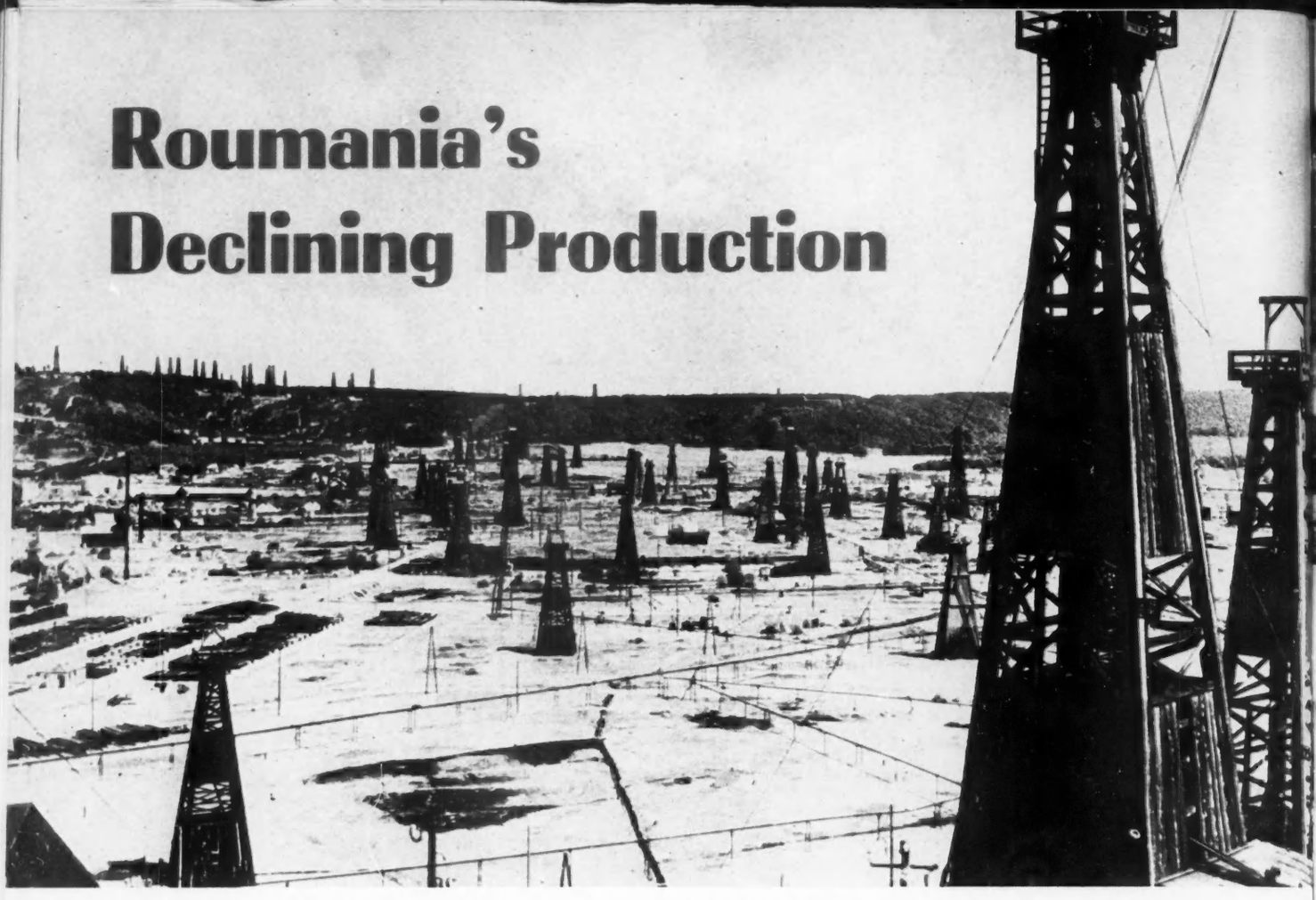
Slurry kept above shoe

BAKER OIL TOOLS, INC.

Houston – Tulsa – Los Angeles – New York

"There's a Baker Man in Your Territory"

Roumania's Declining Production



Roumania's oil fields, including the one near Ploesti, pictured here, are producing about 93,000 barrels of crude oil daily, a sharp increase over the average output of 71,000 barrels daily in 1944, but still under the 100,000 barrels daily supplied the Germans during the war.

AMONG important changes in the Roumanian oil industry is the substantial decrease in crude production. Another is the change in Roumanian oil ownership as a result of the entry of the USSR.

These changes to be discussed here are based on articles in recent issues of *Monitorul Petrolului Roman,* published bimonthly in Bucharest under the direction of Mihail Pizanty.

Roumania produced 34 million barrels of oil during 1945, or a daily average of 93,000 barrels, which is substantially lower than its prewar output. Production was at its lowest in the summer of 1944 with a daily average of only 22,000 barrels in June as a result of intensified Allied bombing which destroyed field tanks, refineries and the transportation system. More destruction followed in the path of German combat and retreat before the Russians. After the armistice of August 23, 1944, by Roumania and the Allies and as a result of the pressing need for motor fuel and aviation gasoline for the Russian troops, Roumanian production was boosted rapidly, quadrupling the June output by the end of 1944 and reaching a high of slightly over 100,000 barrels daily during August, 1945. Because of the great shortage of drilling and production equipment, production is falling off again and 1946 figures are expected to show a further decline.

The productivity of the Ploesti area oil fields, which account for 98 percent of the total oil produced, has been steadily declining since 1936, when Roumania produced 63.5 million barrels. (See Table 1.)

It is interesting to note that Germany's critical need for oil caused production to be maintained at approximately the 1941 average during 1942 and 1943, but the effectiveness of Allied bombs and the first signs of disintegration are reflected by the 1944 figures, particularly in the cracking operations for the production of badly needed aviation gasoline.

TABLE 1
Crude Production of Roumania

YEAR	Annual Production		Average Daily
	Thousands of Tons *	Thousands of Bbls.†	Thousands of Bbls.
1936.....	8,704	63,559	174
1937.....	7,153	52,217	143
1938.....	6,610	48,253	132
1939.....	6,240	45,552	125
1940.....	5,810	42,413	117
1941.....	5,453	39,807	109
1942.....	5,665	41,355	113
1943.....	5,272	38,486	105
1944.....	3,525	25,733	71
1945.....	4,640	33,872	93

(1) From the *Monitorul Petrolului Roman,* published bi-monthly in Bucharest.

(2) For conversion of tons to barrels, a factor of 7.3 was used for crude and fuel oil and 8.5 for gasoline and other light products.

Effects of Bombing

In 1944, the output of cracking plant products was down to 73,000 gallons per day or less than 23 percent of the 1943 average production. The Steaua Romana refinery at Campina, north of Ploesti and located on the left bank of the Prahova River, was an easy target for Allied bombers, which in 1943 reduced it to a third of its 1942 capacity and completely wiped it out in 1944. The plant did not operate in 1945. The Creditul Minier modern cracking refinery at Brazi, installed by the famous Czechoslovakian Skoda works just before the war, located among pine trees in the Carpathian foothills between Campius and the Royal residence at Sinaia, was reduced to 1500 gallons a day or approximately 3 percent of its prewar capacity as a result of a direct bomb hit on August 1, 1943. The Cred-

The oil refining district of Ploesti suffered considerable damage by Allied bombing during the war and many of the plants have not been reconstructed. The picture above shows large fires gaining headway among oil storage tanks of the Creditul Minier refinery following an Allied bombing attack.
Official Photo U. S. Air Forces

itul Minier, which was incorporated subsequently in the USSR-controlled Sovrompetrol Company, is rapidly being rebuilt.

The following account is taken from the Creditul Minier's Annual Report of 7-17-45: "On the basis of the sum due us by Germany for damages sustained, we have ordered in Germany a refinery plant for the replacement of the one destroyed, which plant has a treating capacity of 63,000 barrels daily . . . This plant has been almost entirely delivered . . ." In 1945, the Brazi plant produced 38,000 tons of products, equivalent to 13.5 million gallons a year or a daily average of 37,000 gallons per day. As will be shown later, the Brazi refinery of the Savrompetrol Company will soon reach a leading position under its new control.

Among the other oilcracking plants, Standard Oil Company of New Jersey's Romano-American unit at Ploesti produced during 1944 at 50 percent of its prewar capacity and the Shell Oil Company unit, also at Ploesti, produced at 65 percent of its normal rate, which decrease in part may have been due to diminishing rates of production.

While the Roumanian refineries were subjected to intensive bombing beginning in August, 1943, larger quantities of crude were being shipped westward by way of the Danube River and the German-built pipe line from Ploesti to a point on the Danube west of the Iron Gates where the Danube cuts through the Carpathian Mountains. During 1944, the Allies increased their bombing and dropped a large number of mines in the Danube which were responsible for the great decrease in both manufacture and transportation of petroleum products.

The basic reason for Roumania's gradual drop in crude production since 1936 is due to failure of finding new oil fields. A few deep-seated domes such as Boldesti and Bucsani were discovered to the south of the old piercement-type domes north of Ploesti, but except for this area there have not been any new prospective oil areas discovered in the last 30 years. A detailed discussion of the geology and present development of Roumanian oil fields is offered in an excellent article published by Ray P. Walters in the March, 1946, Bulletin of American Association of Petroleum Geologists, "Oil Fields of the Carpathian Region." Walters was chief geologist for the Romano-Americana Oil Company before the war and returned to Roumania after the war as petroleum adviser with the American Mission in Bucharest.

Among the outstanding completions during 1945, the *Monitorul Petrolului Roman* lists seven wells with an initial production averaging 230 barrels per well per day. These seven wells are in the same Moreni-Ochiuri area of old salt domes northwest of Ploesti.

Exploratory drilling on government land was at a ten-year low of 16,400 feet drilled during 1945. Exploratory drilling on private lands, which are primarily extensions of the old fields, had a somewhat better showing at 65,600 feet. In 1944, exploratory drilling accounted for more than 20 percent of the total but this high percentage was not maintained in 1945. Though intensified drilling activities will no doubt help in the finding of oil, it was the Roumanian government's interference with private enterprise through the changing of the mining laws after the first world war that was responsible to a large extent for the slowing down of prospective activities and the faliure to build adequate new reserves during the pre-World War II period which, fortunately, worked to the advange of the Allies.

Exploratory drililng in The Transylvanian Basin, on the northern and western sides of the Carpathian mountains (the oil fields being on the southern and eastern sides) have revealed additional dry gas reserves. Two ten-inch gas lines are in project, connecting the Transylvanian gas fields with Bucharest. These lines will tie into the Ploesti to Bucharest gas lines which were supplied by oil field gas but the latter are gradually being depleted. Though some gas conservation measures have been enforced for several years, in order to prevent all waste, the government decreed on September 15, 1945, that all gas produced by wells that is not being used commercially must be returned to the reservoir.

The eight leading oil companies, accounting for 80.5 percent of Roumania's oil production during 1945, have outlined a program for 1946 calling for the drilling of 18 exploratory wells averaging 6750 feet in depth and 84 development wells averaging 5230 feet in depth. The eight companies referred to are the Astra Romana (Shell). Romano-Americana (Standard), Steaua Romana, Unirea, Prahova, Concordia, Colombia and Creditul Minier. The last three companies are now part of the Sovrompetrol group.

Of great concern to all operators is the lack of drilling and well equipment, lack of transportation facilities and monetary inflation.

It is estimated that the Roumanian oil industry will need 128,000 tons of drilling equipment, including casing, tubing, pumps, etc. Of these, at least 35,500 tons, including eight-inch casing and larger, will have to be imported because of a lack of domestic supply. Before the war, some 40 to 50 thousand tons were imported annually, a large share of which was shipped from the United States. Russia, Czechoslovakia and France are considered now as more likely source of supply on an exchange

of goods basis. The scarcity of drilling equipment was made worse by the USSR's requisitioning of 48,500 tons, particularly casing, between October, 1944, and January, 1945.

Oil Price Lag

The value of the American dollar, which in 1940 was at slightly more than 500 lei, has increased 6700 percent to 36,000 lei by the end of 1945. During the same period the governmental approved price of oil has been raised by only 1600 percent while casing has increased in price 7000 percent and timber 3100 percent.

This lag in oil prices creates a hardship on oil operators, particularly in view of committed governmental orders to USSR which accounts for 70 percent of the country's production. Any credit arrangements or planing for development is upset by the rapidly changing monetary value. Thus, the dollar quoted at 20,000 lei as of the end of November, 1945, doubled to 36,000 lei by the end of December, 1945.

Inflation is also manifested in the market value of oil stocks. The shares of Shell's subsidiary, Astra Romana, which for many years has been the leading operator in Roumania, increased from 790 lei per share at the end of 1940 to 15,500 lei per share at the end of 1944 and to 165,000 lei per share at the end of 1945. The capital stock of oil companies has followed the general trend of inflation. On September 20, 1945, the stockholders of the Standard subsidiary, Romano-Americana, voted at their annual meeting to increase the par value of their shares from 600 lei to 12,000 lei. Governmental taxes are also exceedingly high. Gasoline, selling for 37,000 lei per ton or approximately $1 for 300 gallons, has a tax of 90,000 lei added to it which is almost 2½ times the net price of the product. These figures may seem low in dollars and cents value but it should be remembered that at present the average schoolteacher, engineer or office worker does not average more than 10 to 15 cents a day in our money. These are the fortunate few, since a very large percentage of former office employes and professional people are out of work.

Prior to World War II, Russia had practically no interest in the Roumanian oil industry. The changes brought about by the war brings the Carpathian oil fields definitely under the USSR influence. By the economic agreement signed in Moscow on May 8, 1945, between Roumania and USSR, the Sovrompetrol Oil Company was organized for the exploration, exploitation, refining and sale of petroleum products. Absorbed by the Sovrompetrol on the basis of stock exchange are the following oil companies, including their leases, wells, refineries and all other assets as per value shown in the following tabulation:

Name of Company	Value of assets credited as allotments in the Sovrompetrol Co. (Millions of lei)
Creditul Minier	700.0
Redeventa	400.0
Concordia	755.8
Colombia	325.0
Petrol Block	285.5
I.R.D.P.	115.5

The assets of the last four companies listed above are supposed to represent the interest owned by Germany and her allies in these companies, and which was taken by the USSR as war booty. However, in final analysis, this ownership is open to discussion. Colombia was primarily a French-controlled company and Concordia was a Belgium-controlled company. I.R.D.P., Petrol Block and many of the other companies had large shares of French interest. When the Germans conquered France and Belgium, they assumed the French and Belgian interests as war booty in the same way as USSR is assuming this so-called German interest as their price of victory.

The total value of the assets and the share taken over by the USSR in various oil companies is shown in Table 2.

Aside from the interest credited in the table to the Russian group the latter is to furnish some equipment. The Roumanian group is to bring some government owned prospective oil acreage. The capital of the Sovrompetrol is 5 billion lei with the USSR owning one-half interest.

Four of the major operating companies do not appear in this merger, namely: Astra Romana, subsidiary of the Shell group; Romano Americana, subsidiary of Standard Oil Company of New Jersey; Steaua Romana, former German controlled company before World War I and shared equally by England, France and Roumania after War I; and Unirea, controlled by the English owned Phoenix Oil and Transport Company.

The USSR group is represented by the Obiedinenie Ucrneft and Vassojusnoe Obiedinenie Sojusneftexport Companies.

TABLE 2

Company	Total Value of Assets (Million Lei)	Percent Taken by USSR	Value Taken by USSR (Million Lei)
Concordia	1,470	51.4	755.8
Colombia	380	85.5	325.0
Petrol Block	470	60.9	285.5
I. R. D. P.	600	19.3	115.5
Kontinentale Oel	100	100.0	100.0
Others	241.5	73.7	178.0
Total	3,261.5	53.9	1,759.8

Two statements made by Anton Dimitriu, a Director of the Creditul Minier and member of the board of the Sovrompetrol, are of general interest:

"The 'Sovrompetrol' is a large, possibly the largest oil company of Europe . . . the Roumanian group has not as yet carried out its commitments (to the Sovrompetrol) due to opposition by certain reactionary groups."

It seems that the merger has met with some opposition among the Roumanian stockholders, although there was not much choice in the matter.

The following editorial appears on page 53 of the January-February, 1946, issue of the *Monitorul Petrolului Roman:*

"To replace drilling and refinery equipment stocks which have dwindled and in some type of equipment which are entirely exhausted, we are expecting the supplies ordered to the USSR heavy industry. It is self-understood that the first deliveries of this material will be delivered to the companies belonging to the Sovrompetrol group."

Fight for Survival

It will be interesting to follow the fight for survival of the four companies that did not join, although thus far their operations seem normal.

The Distributia Company, which is a domestic sales organization of oil products, controlled by the Astra Romana (Shell), Romano-Americana (Standard) and Steaua Romana, has not lost its identity and its management and operations seem to proceed without visible interference.

Other mergers of independent or state-controlled Roumanian companies with the USSR group include the Sovromtransport, formed by the merger of the Societatea Anonima de Navigatie pe Dunare (Danube Steamship Company, Ltd.), Administratia de Stat a Porturilor si Cailor de Comunicatie pe Apa (State Administration of Ports and Waterways) and Administratie de Stat a Navigatier fluviale (State Administration of River Navigation) with the "Softracht" union and other USSR organizations, the latter assuming 50 percent of the 3 billion par value of the shares in the Sovromtransport.

The USSR has also taken as war booty 90 percent of the capital assets of the Commercial Bank of Roumania and the Banking Society of Roumania as representing former German interests in these banks and a sizable interest in other banks.

It is obvious that USSR will continue to dominate Roumania not only politically but economically as well. These two factors will no doubt influence the future development of the oil industry in Roumania.

Mexico Steps Up Production As Export Trade Expands

ALTHOUGH Mexico's daily oil production has shown a sharp increase during the past few months, crude withdrawals from storage also are being hiked to meet a growing export trade.

The increased production is being made from existing fields without the benefit of new discoveries. Crude production, as reported by Petroleos Mexicanos, for the first three months of 1946 totaled 11,210,000 barrels. The daily average production for January amounted to 115,600 barrels, for February 126,100 barrels, and for March, 132,100 barrels as compared with a daily average for 1945 of 118,000 barrels.

Poza Rica accounted for 67,710 barrels daily in March, compared with an average of 62,692 barrels daily during 1945. The Northern Vera Cruz, or Tampico, fields produced 22,680 barrels daily in March, which was in contrast with 14,442 barrels per day during 1945. The Southern Vera Cruz fields produced 26,380 barrels daily, down slightly from an average of 27,469 barrels per day in 1945. The Isthmus fields produced 15,330 barrels daily, in contrast with 14,319 barrels per day in 1945.

Consumption Increase

Mexico's domestic consumption has been increasing steadily. Domestic consumption of domestic production climbed from 53,500 barrels daily in 1935 to 97,250 barrels daily in 1945.

During January and February about 450,000 barrels of oil were withdrawn from storage during the two-month period. In the two months, production and withdrawals from storage totaled 7,565,000 barrels. Of the total, 1,340,000 barrels were exported and 6,225,000 barrels consumed in the country, or a daily average domestic consumption of about 105,000 barrels.

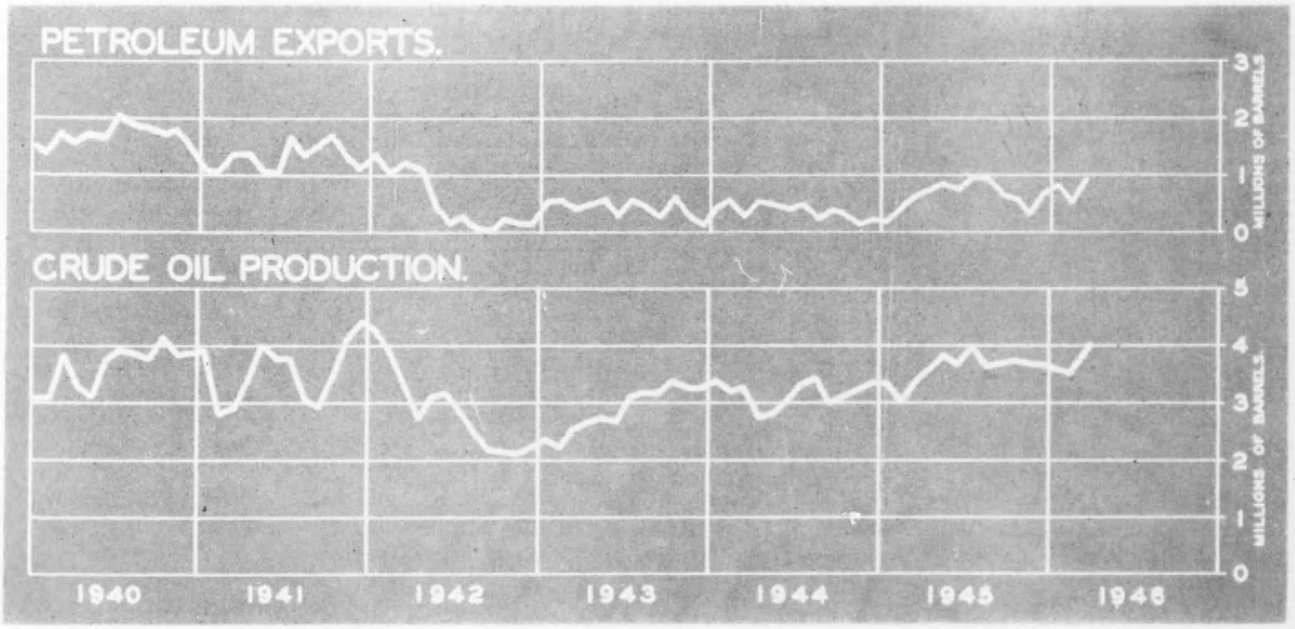
Significant of Mexico's re-entrance into world markets are two March cargoes to widely separated destinations—65,000 barrels of Panuco crude to China, and 64,000 barrels of fuel oil and 1200 barrels of asphalt to Switzerland.

This is the first cargo of Panuco crude shipped from Mexico since 1943. Panuco crude is the heavy (12 to 13-gravity) Mexican crude best known for its premium asphalt content.

Quarterly Exports

Exports for the first quarter of 1946 has reached 2,250,000 barrels, of which 1,150,000 barrels (500,000 barrels of light crude and the balance about equally divided between fuel oil and gas oil) went to the United States. Cuba received about 850,000 barrels of fuel oil and two cargoes of the same were delivered to the U. S. Navy at Panama.

Should Mexico's exports for the year continue at this rate, the total of 9 million barrels for the year will exceed last year's exports by 2 million barrels and will practically double the 1944 exports of 4,700,000 barrels.



Japanese Oil Industry Pruned

LOUIS F. SCHIMANSKY, petroleum research scientist, recently returned from a survey of the Japanese oil industry, told the Society of Automotive Engineers in San Francisco last week that the Japanese petroleum industry is being pruned to the point where it can never support another war.

Schimansky went to Japan as a member of the Oil and Chemical Division of an Army strategic bombing survey. He has returned to work with California Research Corporation, a Standard Oil Company of California subsidiary, where he is supervisor of process laboratories.

Although he said that the size of Japan's oil industry is still a subject of study and consideration by American economists and petroleum experts, "it is going to be limited to the minimum essential to prevent a breakdown of the economic structure."

He outlined the development of the industry in Japan, its prewar accomplishments, and the industry's production and progress during the war.

Japan's first refinery was built in 1880, Schimansky reported, and consisted of a shell still for distillation of crude oil. From those beginnings, he said, "grew an industry which . . . became vital enough to the Japanese economy to be one of the principal reasons for . . . war.

"In the decade from 1930 to 1940, the Japanese refining capacity was roughly tripled. Most of the refineries were owned entirely by Japanese companies.

"The situation in 1935, taking that as a fairly representative prewar year, was as follows: Japan was producing about 2 million barrels per year of crude oil and importing 30-40 million barrels, about half of which was crude oil and half refined products. Thus, Japan was very dependent on imported oil as her own fields were producing very nearly the maximum possible and then only supplied about 5 percent of the demand."

Reserves Built Up

As a result of this situation, Schimansky stated, around 1935 several moves were begun to strengthen the country's oil position, and all companies were required to build up large oil reserves. In addition, the Japanese army and navy engaged actively in the business of oil refining, and a seven-year plan for synthetic oil production was formualted. Steps also were taken to reduce civilian oil consumption, and in 1940 the use of gasoline in private automobiles was greatly curtailed, resulting in an 80 percent reduction in the use of this fuel.

LOUIS F. SCHIMANSKY

Schimansky described oil processing equipment as ranging from that which was obsolete 20 years ago to some which was considered modern in 1939.

"Thus, the Japanese refineries had some modern pipe still distillation units, vacuum distillation units for the production of lubricating oils and asphalts, some lubricating oil plants which included solvent treating, solvent dewaxing and clay treatment for the production of high quality aviation lubes. Thermal cracking units of American design and some which had been slightly altered from the original design to avoid payment of royalties were in use.

"The Japanese also had the processes for the production of high octane gasoline which were available in 1939, at which time the Americans put an end to transfer of information. These processes included polymerization of butenes to polybutenes followed by hydrogenation to isooctane, a very crude catalytic cracking process based on the Houdry process, which was the only catalytic cracking process available at the time transfer of information ceased, and hydrogenation plants, designs for which had been largely obtained from the Germans.

"One plant for the catalytic dehydrogenation of butane to butene had been constructed but never placed in commercial production. Sulfuric acid alkylation was too new to be an important part of the Japanese refining scheme."

Synthetic Program Lagged

In a comparison of synthetic production, Schimansky stated that while the Germans had years of experience and "knew all the angles," the Japanese were novices. As a consequence, he said, their synthetic program lagged far behind schedule, and product quality did not come up to specifications.

"However, while the synthetic oil industry was not important in supplying oil for Japan's war-time needs, it was of importance in that it drained off a lot of material and manpower which might have been expended to greater advantage in other fields.

"Compared to American standards, the construction record of the Japanese was pitiful. Consider a specific example. Construction of one synthetic plant was begun in 1940. The first production from the plant was obtained late in 1942. By 1944, the plant was still only sufficiently completed so that it could be operated at about a quarter capacity."

Describing the extent of their synthetic program, Schimansky said that work was carried out on the use of alcohol, including methanol, ethanol and butyl alcohol as motor fuels, animal and vegetable oils as sources of lubricating oils and gasoline from rubber.

"Strangely enough," he reported, "while work was going on concerning the conversion of rubber to a liquid hydrocarbon, other work was undertaken on methods of making synthetic rubber from petroleum. This situation appears a bit anomalous, but it probably was just a manifestation of the Japanese habit of playing both ends against the middle whenever possible."

Schimansky said the Japanese had only a rudimentary understanding of the art of catalytic cracking.

"However, with the aid of German scientists, they did embark on such processes as the production of aviation gasoline from butyl alcohol by converting the alcohol to butene, polymerizing the butenes and hydrogenating the polybutenes to isooctane."

Government, Drilling Company Differ on Australian Field

Recent Australian government reports on the oil-bearing sands of the Lakes Entrance field, in Victoria, states that an area of 400 acres and 16 feet of producing horizon contained only 560,000 barrels of oil. It was the official opinion that only 15 percent of this amount was recoverable and the federal and state governments had decided to abandon their efforts to exploit the field.

C. S. Demaine, managing director of Austral Oil Drilling Syndicate, said it was his opinion that 5000 acres were already proved and if the content was similar to the 400 acres tested by the government there would be 7 million barrels available. His company did not accept the government estimates and believed that the full thickness of the oil sands contained more oil than the government advisers had taken into account.

It was proposed to recommend to the shareholders that the company should carry out production tests on the field. The government had offered to revoke the Commonwealth rights and obligations held under National Security Regulations regarding this field in favor of the Austral Oil Drilling Syndicate and to sell to the company the plant installed by the government. However, final disposition of the properties has been held up pending further government investigation.

Australia Seeks Synthetic Oil Machinery from Germany

Australia may receive German machinery used in the production of synthetic oil from coal as part of her share of war reparations, according to the Minister for Post-War Reconstruction Dedman. The minister said that the Australian Scientific Mission in Germany had been specially interested in this hydrogenation process.

Paraguay Discussed

Earl B. Noble of Los Angeles, Union Oil Company of California, and president of the American Association of Petroleum Geologists, discussed the geology of Paraguay at a meeting of the Houston Geological Society May 27.

Noble explained that there is very little geological information available now on this South American country. The rocks of eastern Paraguay are of older Devonian age. Union Company now is preparing to spud a 9000-foot test in the Chaco of western Paraguay.

Kuwait Production Expected to be Shipped Before End of Current Month

Actual shipment of oil from Kuwait is expected to begin sometime around the end of June, according to latest information. It had been anticipated that this Persian Gulf country would start oil shipments perhaps 30 days earlier.

New tankage has been erected and all facilities will be in readiness within a very short time. No new wells have been drilled in addition to the nine producers drilled prior to the war. These nine wells, plugged at the time an enemy invasion seemed probable, have been reworked. Six were finished as dual completions and preliminary tests indicate they should be more than able to take care of the 30,000-barrel-a-day output planned by Kuwait Petroleum Company (Gulf and Iraq) as a starting production rate for the field. Drilling equipment is being moved in for the drilling of additional wells now that the rehabilitation work has been completed.

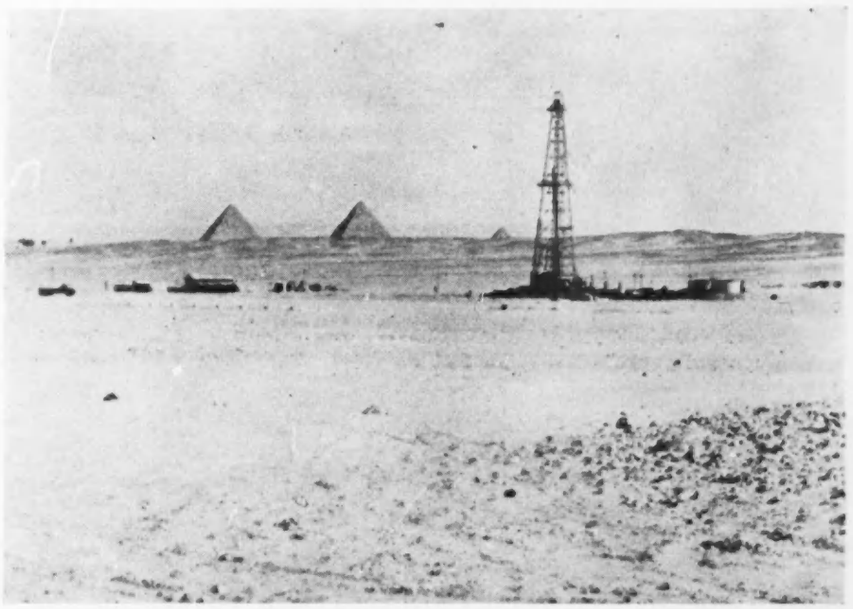
The wells had all been sealed in with a full string of blank liner, and in addition had been plugged with cement for a considerable depth from top of the hole. Re-completion called for drilling out cement, re-examining electric logs and core records, perforating and squeeze jobs.

Production apparently will be limited by availability of tankers more than by physical limitations of either producing wells or handling and loading facilities. The field is served by perhaps the longest gravity loading lines ever to be in service. Tankers will take on crude at a dock located six miles from the tank farm. The tank farm is built at an elevation 335 feet above Gulf level and loading is entirely by gravity through a 22-inch loading line. Crude is pumped to the tank farm through a 10-inch line 8 miles long capable of taking care of several times the proposed volume.

Dalemont Visits

Etienne Dalemont, New York director of the French agency, Groupement d'Achat des Carburants, Combustibles liquides, Lubrifants et derives, was a Houston visitor recently. Dalemont this month will leave for France for a stay of two months.

Wildcat Near the Pyramids



Standard Oil Company of Egypt's Abu Roash 1, a wildcat test situated near the pyramids of Giza, about 10 miles west of Cairo, Egypt, presents an unusual setting for modern oil well drilling equipment. The photo was taken by D. B. Sicher, geologist on the well.

Saudi Arabia Oil to Argentina; Becomes Fifth Largest Producer

With postwar increases in tanker availability and continued demand, Saudi Arabia is now the fifth producing nation in the world. The country is currently producing in excess of 160,000 barrels of crude oil daily from three fields—Damman, Abqaiq and Quatif. About 80,000 barrels daily is being processed in the Ras Tanura refinery, which went on stream last October. Some 60,000 barrels daily of the remainder is moved by pipe line to Bahrein Island for refining in the Bahrein refinery. In 1944, Saudi Arabia's production averaged but 21,000 barrels daily, and the country ranked seventeenth.

Negotiations are now under way for the sale of 400,000 tons (approximately 2.8 million barrels) of crude to the Argentine government through its YPF for delivery during the next 18 months, but as yet no contract has been signed. This would be the first movement of Middle East crude oil to markets in the Western Hemisphere.

The Ras Tanura refinery, representing an investment of more than $40 million, and the Bahrein refinery which received additions during the war amounting to $30 million, are expected to continue during peacetime at war levels, the only reduction in output being in the production of aviation gasoline. According to officials of the operating concerns, the present demand for products from the Persian Gulf actually exceeds the peak attained during the war.

The Saudi Arabian fields are operated by the Arabian American Oil Company, and Bahrein properties are operated by Bahrein Petroleum Company, both being owned jointly by Standard Oil Company of California and The Texas Company. Right-of-way now is being acquired for the 1070-mile pipe line to link Persian Gulf fields with the Mediterranean seacoast.

Arabian American employs more than 800 Americans, 8000 Saudi Arabia nationals, and 1000 people of other nationalities in operating the fields and refinery in Saudi Arabia, while the Bahrein Company is staffed by some 500 Americans and British, and 5000 Bahreinese.

Bahrein Undisturbed by Iran's Threat of Oil Tax

Iran's recent threat to tax oil produced on Bahrein Island and shipped to Iran apparently has not disturbed Bahrein Petroleum Company, sole producer on the island, as the company does not ship any oil or products to that country.

Most of the Bahrein oil is refined on the island or in Saudi Arabia. Bahrein Petroleum Company is owned by Standard Oil Company of California and The Texas Company.

Iran Strike Ends After Halting Oil Production

A strike supported by thousands of workers of the Anglo-Iranian Oil Company ended May 27 after halting for two weeks the production of vast oil fields and large refineries in Iran.

The striking workers returned to their jobs after agreement to submit their demands—including doubling of present wages and a month's annual vacation with pay—to an Iranian government arbitration commission.

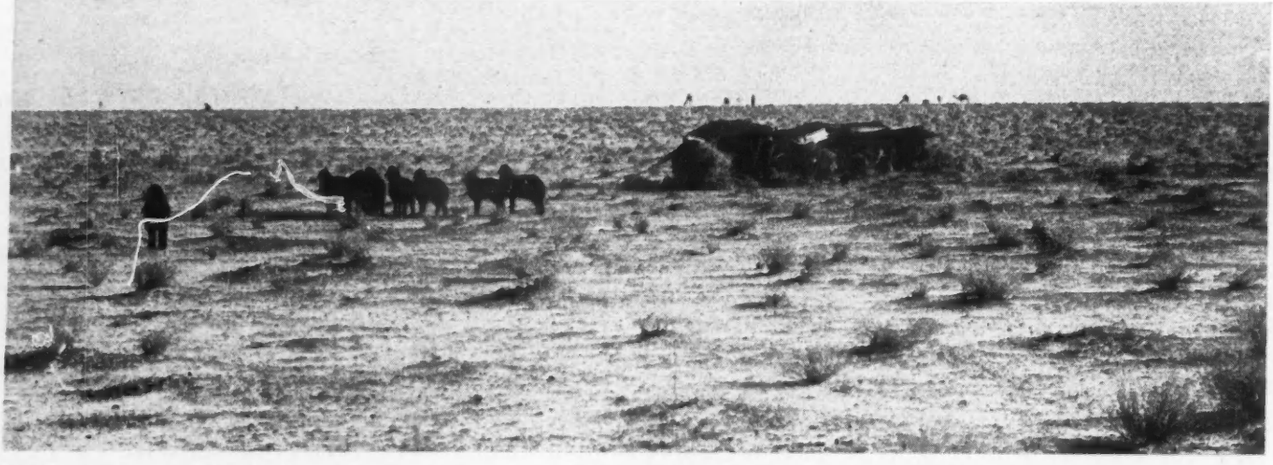
Greatwood Speaks

H. R. Greatwood of the foreign department of Union Oil Company and formerly Lieutenant Commander in the U. S. Naval Reserve, spoke on "Southwestern Asia" at the May 22 meeting of the Southern California Section AIME. Recently returned from active service in the Indo-China-Burma theater under General Stillwell, General Sultan and Lord Mountbatten, Greatwood gave special emphasis on the various phases of the oil industry in that region.

Goodwin Returns

Dr. R. T. Goodwin, manager of the Shell Oil Company's aviation department in New York, recently returned from a seven-week's flying trip through Central and South America during which he visited 22 countries and covered 15,273 miles in an actual flying time of only 100 hours. A similar trip by boat would have taken seven or more months, if passage were available, he said.

New Pipe Line Traverses This Country



Bedouin camp in typical "dikaka" country in northeastern Saudi Arabia. Much of the territory to be traversed by Arabian American Oil Company's proposed pipe line to the Mediterranean from the Persian Gulf area is of this type.

Mene Grande Puerto la Cruz Terminal Sets New Loading Record in April

Operation of Mene Grande Oil Company's crude oil loading terminal at Puerto la Cruz in eastern Venezuela reached an all-time peak during the month of April when it loaded out more than seven million barrels of crude. It thus surpasses the peak of wartime activity when it was loading around five to six million barrels each month.

This is a good recommendation for the efficiency of operations at this terminal, which has space at its docks for loading only two ships at a time. All loading here is by gravity from the loading tanks situated in the hills above the terminal, and the April volume represents an average of 10,000 barrels an hour, night and day throughout the month without making any allowances for time consumed in moving ships to and from the docks and short waits for tankers to arrive in port.

Facilities at the port are owned jointly by Creole Petroleum Corporation with Mene Grande Oil Company, but all operations are carried on by the latter company.

North Mexico Fields Show Production Gain in March

The daily average oil production in Mexico's three northern fields—Poza Rica, Naranjos, and Panuco—continued to show an increase during March, reaching 111,452 barrels, compared with 108,228 barrels in February and 97,991 barrels in January. Production in the three fields totaled 3,455,021 barrels during March. Output in February was 3,030,183 barrels and in January 3,037,724 barrels.

Stocks in the fields and at the terminals in the northern zone totaled 3,524,266 barrels on March 29, 1946, compared with 3,998,415 barrels on February 28.

The first large postwar shipment—62,314 barrels—of asphalt from Mexico to Europe left Tampico for Antwerp on April 3.

England Wildcat Test Is Drilling Below 2200 Feet

D'Arcy Exploration Company's Kirkleatham 2, wildcat test in Yorkshire, England, south of Hartlepool, was last reported drilling below 2200 feet in Permian. This wildcat is located near the Kirkleatham 1 which was abandoned at 3736 feet in carboniferous after logging traces of oil and gas.

The company now is conducting seismic work in the Formby area and preparations are being made to deepen the Formby 1 from its present depth of 6382 feet where it was temporarily abandoned. Gravity work is continuing in Wiltshire with the object of locating possible buried carboniferous structures north of the Mendip uplift.

Houston Designated as Airplane Port of Entry

Houston became an international air gateway and a major point on the world air map May 22 with the Civil Aeronautics Board granting three airlines certificates to fly from Houston to Central and South America. The certificates were granted as follows:

Braniff Airways, Inc., will fly planes to Havana, Cuba; Balboa, Canal Zone; Bogota, Colombia; Quito, Ecuador; Guayaquil, Ecuador; Lima, Peru; La Paz, Bolovia; Ascuncion, Paraguay, thence to Sao Paulo and Rio de Janeiro, Brazil, and to Buenos Aires.

Houston was named co-terminal with New Orleans for Chicago & Southern Air Lines, Inc., flights to Havana and Camaguey, Cuba; Port au Prince, Haiti; Cuidad Trujillo, Dominican Republic; San Juan, Puerto Rico; Kingston, Jamaica; Aruba and Curacao, Netherlands West Indies, and Caracas, Venezuela.

Houston also was named co-terminal with New Orleans on Pan American Airways, Inc., flights to Merida, Mexico, and Guatemala City, Guatemala.

Phelps Succeeds Clover As Head of Oil Section

R. G. Phelps, formerly with Colonial-Beacon Oil Company, is the new chief of the Oil Section, Economic Division, Office of Military Government of the United States in Berlin. He succeeds Philip Clover, who returned to the United States March 31. J. W. Perry will be the deputy chief.

Lieutenant George L. Dalferes of New Orleans, and Lieutenant Frank J. Gardner, formerly with Rinehart Oil Publications in Houston, both formerly with the Oil Section, are returning to the United States and expect to leave the Armed Service.

Feldman Said Dealing for Colombia's Royalty Oil

Recent reports indicate that D. D. Feldman, Dallas independent operator, and the Colombian government had reached some kind of an agreement for joint exploitation of government royalty oil. The royalty oil amounts to about 3 million barrels annually.

Terms provide for the construction of several "large" refineries, with Feldman subscribing the entire capital stock of a new corporation to handle the job, it was reported. In addition to the refineries, the new corporation would establish a chain of service stations in Colombia. The agreement, reports cited, gives the government 50 percent of the profits and after 30 years, an additional 10 percent.

In connection with such an agreement, New York sources point out that Colombian law prohibits sale of royalty oil for a period exceeding three years without additional specific approval by the Colombian congress. These sources also cited that any such contract could not become effective sooner than two years after approval or perhaps, in the present case, sometime in 1949.

Europe Building Tankers And More Storage for Oil

Crude oil storage capacity on the mainland of Europe is being steadily increased. Tanks and much of the other storage facilities suffered considerable damage during the war.

At the same time, there is a large-scale tanker construction program under way in order to meet the transportation needs to fill the new storage construction.

The Dutch newspaper *De Nieuwe Dag* recently reported that 14 new tanks were under construction at Amsterdam petroleum harbor. It is intended to raise the storage capacity from 10,000 tons (about 70,000 barrels) to 106,000 tons (742,000 barrels) before the end of this year.

To enable the port of Gdansk (Danzig) to handle UNRRA oil, work has been started on enlarging the installations. At present Gdansk has storage capacity for 30,000 tons (about 222,000 barrels) and Gdynia for 15,000 tons (111,000 barrels). The Central Oil Industry Board is trying to repair underground storage for 30,000 tons at Oksywia. At the former German port of Stettin, now called Szczecin, the Polish harbor authorities will shortly take over 30 storage tanks with a capacity of 40,000 tons (296,000 barrels).

O'Mahoney Gives Principal Talk to New York Nomads

Oil can never again be made the instrument of exploitation in the postwar world, Senator Joseph C. O'Mahoney, of Wyoming, told the Nomads, and their 300 guests at their annual dinner in New York, May 15.

"Business and political leaders share equally the responsibility for maintaining, at home and abroad, the American ideal of living, which is that all authority for concerted action, both economic and political, proceed from the people who are affected," the Senator said. "The world cannot turn back to arbitrary power. It must go forward to broader horizons of personal liberty."

W. R. Boyd, Jr., president of American Petroleum Institute, introduced Senator O'Mahoney. Presiding was John H. Baird, president of the New York Chapter of Nomads. William G. Green, president of Engineering Laboratories, Inc., Tulsa, and a member of the Nomads' Board of Regents, spoke briefly on the national organization.

International Guests

Among the international guests present were: Juan Bennasar, Chief of the Commission in the United States, Argentine Government Oilfields, Buenos Aires, Argentine; P. K. Ozinga, drilling superintendent, Shell Company of Ecuador Ltd., Quito, Ecuador; A. J. Machicao, Bolivian Government Oilfields, La Paz, Bolivia; M. Schwab, Jean Bertaux and Roger Battin of the SN Marep Mission in New York and Pierre Abadie of the SN Marep Mission in Washington; J. C. Ledermann, Field Supt. Societe Nationale des Petroles du Languedoc Mediterraneen; S. Mekartumov and N. S. Tiodimfee of The Government Purchasing Commission of The Soviet Union in the U.S.A., Washington, D. C., and Phil Reed, District Manager, Richmond Exploration Company, Maracaibo, Venezuela.

Also present were H. M. Hohmann, Bataafschi Petroleum Maatschappij, The Hague, Holland; R. M. Tychanowicz, Polish Supply and Reconstruction Mission in North America, Washington, D. C.; Enrique Otero, publisher of *El Nacional*, Caracas, Venezuela; J. D. Fullerton, Production Superintendent, Apex Trinidad Oilfields, Fyzabad, Trinidad; W. J. Connley, Creole Petroleum Corporation, Caracas, Venezuela; B. A. Myers, vice president and director, International Petroleum Company, Toronto, Canada; C. B. Hopkins, director, Imperial Oil Company, Toronto, Canada; Ross McAllister, Campbell McKee Company, Montreal, Canada, and S. Kajfez, Cardwell Manufacturing Company, Constantinople, Turkey.

Nomad Visitors at Los Angeles

Foreign guests attending the May meeting of the Los Angeles Chapter of Nomads included, top, left to right, Juan Pedretti, Vice Consul of Paraguay; Dr. Pedro Abreu, Consul of Venezuela, and Florent H. Bailey, Pantepec Oil Company of Venezuela, bottom, standing, left to right, W. C. Eyre, Arabian American Oil Company, Saudi Arabia; Milton Hobbs, Standard Vacuum Oil Company, Netherlands East Indies; S. Y. Chow, Chinese National Resources Commission; Erno Bonebakker and Lieut. A. A. Middleberg, Shell Interests, Netherlands East Indies; kneeling, left to right, J. W. Clampitt, Iraq Petroleum Company, Iraq, and Sanford Hall, Burma Oil Company. Foreign guests not shown in the pictures were R. J. Maitland, Kern Oil Company, England, Ted Miles, Union Oil Company, Paraguay, and H. C. Tung, Kansu Petroleum Administration, China.

Nomads Speaker Tells of Chile and Bolivia Oil

Chile's first oil well, brought in last December in the Magellanas region in the southernmost region of that country "is not a particularly good well" but an immense structure has been proved, according to Sam Low, Houston lawyer, who served for three years during the war in Santiago as a representative of the Board of Economic Warfare.

Low, who spoke May 27 at the monthly meeting of the Houston Chapter of Nomads, said that many Chileans admit that they could not operate a big oil field, if they get one, but "they want the thrill of playing around with one." He pointed out that an American geologist, Glen Ruby, made the locations in Chile and that a Texas drilling firm, George P. Livermore, Inc., which drilled the well "has a most favorable" contract with the government.

"In the opinion of a number of geologists the Bolivian Chaco contains the best reserves on the continent," Low declared, commenting that "best results likely would come under private operation."

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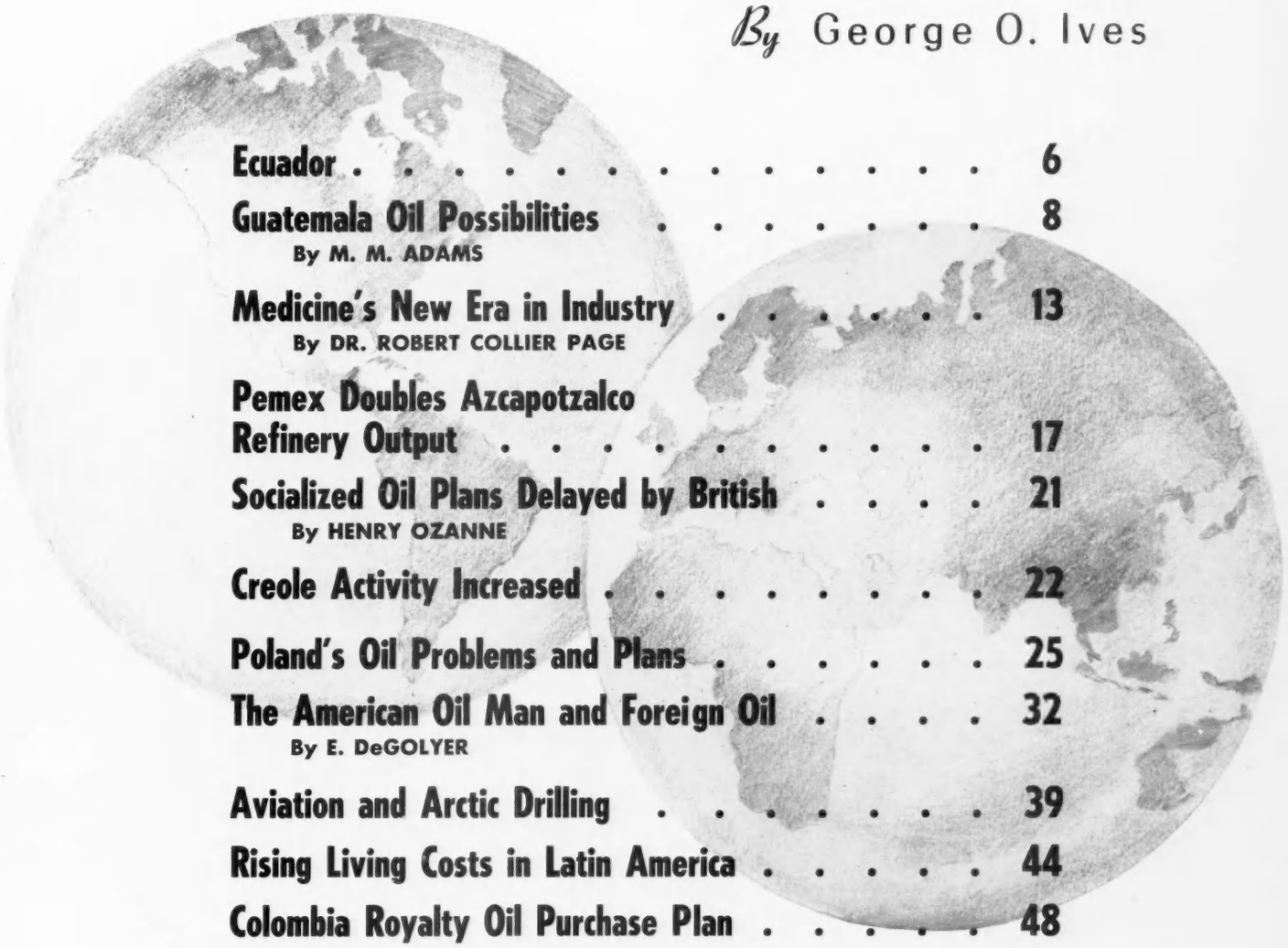

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Picture of simplified construction

4 PLUNGERS and a BARREL

HERE'S how Oilmaster's standardization program eliminated needless duplication of parts. By terminating four conventional oil well pump Plungers (ONE-PIECE CHROME PLATED—HARDENED IRON COMPOSITE—SECTIONAL CUP—COMPOSITION RING) with API pin end connections on *both ends*, ONLY ONE SET OF PLUNGER FITTINGS IS REQUIRED FOR THE ENTIRE GROUP.

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Colombia Wildcatting

By GEORGE O. IVES
Staff Writer

THE anticipated upswing in Colombia's exploratory program is beginning to take definite form, with new wildcats starting in areas scattered throughout the country except in the Llanos area, east and southeast of the Andes Mountains in Southeast Colombia. Most of the activity is centered along the Magdalena Valley, but work is planned for the northwestern departments as well.

Also noticeable is the trend toward deeper drilling. Heavy rigs are being moved in for most of the new wells . . . rigs capable of drilling to 12,000 feet, and companies in several instances have announced intention of going to that depth, or as nearly so as is practicable.

Under the present system of granting concessions, a number of years must elapse between original application and final approval, and many applications have been held up during the last couple of years while new oil legislation was being considered. Of more than 400 applications for concessions during the past 15 years, only slightly more than 50 have been granted. This exercises a strong retarding influence on activity, but it is understood that this condition may be improved somewhat as an outgrowth of expected conferences between Colombian officials and representatives of the companies.

Here is a wildcat location in Colombia showing the typical terrain of the Magdalena Valley region. Much work has to be done in clearing location and building roads before derrick and drilling equipment can be moved to the location.

First Payoff

This upswing of wildcat drilling apparently has its first payoff in The Texas Petroleum Company's Valazquez 1 in the Upper Magdalena Valley region, Department of Boyaca, just east of the Magdalena River and 150 kilometers (about 93 miles) upstream from Tropical Oil Company's El Centro area and Shell's Casabe area.

Latest reports say the operator has decided to set casing for a production test following a drill-stem test of 20 feet of saturated pay sand at 7254-74 feet which recovered 15 stands of light, 35-gravity oil in 13 minutes. The test was cored to about 7300 feet where pipe will be set.

The pay itself has not been definitely identified, but it is very similar to a sand known as the Guaduas Sans, a member of the Tertiary. However, it is possible it may prove to be part of the Upper Cretaceous or in the transition period at the top of the Cretaceous. In any event it will be of much importance if productive, as it will open a new area and a new horizon as well. Other production in the Magdalena Valley is from the Miocene, Oligocene and Eocene. Other Cretaceous production in Colombia and Venezuela has been found to be very productive.

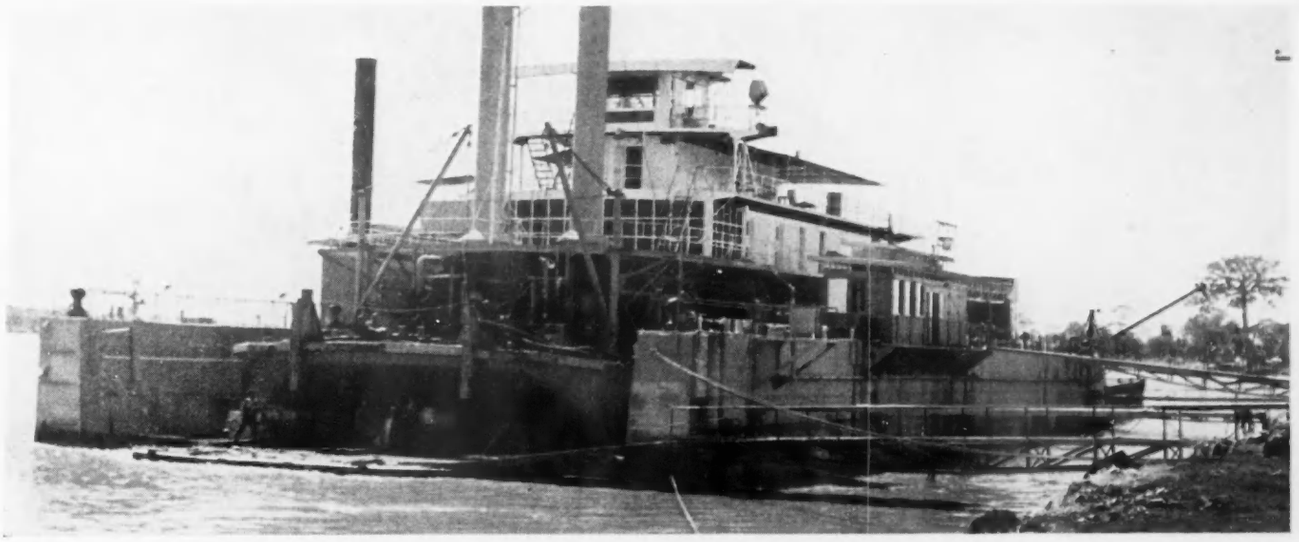
This is the first wildcat to be drilled by The Texas Petroleum Company in Colombia, although the company began acquiring acreage in the country some 16 years ago.

In addition, The Texas Company, the parent firm, holds other property in Colombia, being a joint owner of the Colombian Petroleum Company with Socony-Vacuum Oil Company, which purchased its interest in the Barco property following the discovery of oil on the concession.

Another feature of the new discovery is that it is on privately owned land. The Texas Petroleum Company purchased the acreage in fee several years ago. The courts have ruled that persons having purchased acreage from the state or crown prior to the formation of the Republic can retain the surface and mineral rights with approval of the government. Court tests have established the ownership of the oil as being vested in The Texas Petroleum Company.

Two recent wildcats to commence operations are being drilled by Columbian Gulf Oil Company in the Upper Magdalena Valley, about 350 miles up-river from the Caribbean. On neighboring concessions, Gulf has spudded Sardinata

Arrow points to location (H-6) of The Texas Petroleum Company's Valazquez 1, in the Department of Boyaca, 93 miles upstream or south of the producing area at Barranca Bermeja, which recovered oil on drill stem test to indicate the opening of a new field in Colombia.



Efficient functioning of marine equipment is of paramount importance in drilling for oil in Colombia. Tropical Oil Company has built this floating drydock for servicing boats and barges.

1, and was to have begun Zahino 1 before the end of June. Both of these wells are on concessions bordering the river, and both are being drilled with new heavy-duty rigs just brought in from the United States. The two wells are just southwest of the Yondo Concession on which is located Shell's Casabe field, and almost due west of the DeMares concession from which Tropical Oil Company produces the major portion of Colombia's oil. Rigs for both of these wells are capable of going to 12,000 feet, and of 10,000 feet of seven-inch casing is on the ground.

Costarica 1 Test

Tropical Oil Company and associates are drilling Costarica 1 in the Lower Valley region, still without releasing complete information, but the well is drawing considerable attention, since, if productive, it would prove production on a trend already producing on Shell's El Dificil concession. Drilling below 8760 feet at time of latest information, operators are reported preparing to set a string of casing for tests of sands found in the Miocene and possibly lower formations. The Miocene-Oligocene contact was picked at 6300 feet and a number of sands have been reported from depths as shallow as 2300 feet on down to the very base of the Miocene at 6300 feet. Most of these sands have reported good showings of oil and gas, but have not been tested. On trend with the Dificil and San Angel areas, base of Miocene at 6300 feet correlated with a similar point of 4300 feet at El Dificil. The company plans to drill another deep test in the same area, beginning late in 1946 or early in 1947.

Tropical is currently preparing to spud the most northerly well in Colombia, the Tubara 1, Department of Atlantico, just west of the city of Barranquilla, and scheduled to 12,000 feet. The company's activity on the De Mares concession includes three rigs running in the La Cira field, one in the Colorado field, and another at Galan, where the fourth well is preparing to complete at 4380 feet.

Also in the Lower Magdalena Valley, in northern Colombia, Richmond Petroleum Company's Caraballo 1 has now become the sixth well in the country to drill below 10,000 feet, having reached a depth of 10,162 feet at latest report. It has been eight months drilling to this depth and is still going. The deepest well ever to be drilled in Colombia was a wildcat by Shell carried to 10,929 feet. Other 10,000-foot wells were two more by Shell, one by Socony-Vacuum, and one now operating on the Barco concession by Colombian Petroleum Company. This is the Tibu 21-K, which is standing cemented at 10,555 feet after cementing a string of 10,500 feet of seven-inch casing for tests of the Cretaceous.

Other wells being drilled by Richmond are the Chorrea 4 in the Upper Valley northwest of Bogota, which hit basement granite at 7025 feet and is now reported preparing to test upper formations after drilling 21 feet into the granite. Richmond is drilling below 1650 feet in Gutierrez 1 in the same area.

Socony-Vacuum is currently drilling three wildcats in addition to two field wells at Sinu and two at Cantagallo. Its most recent well, La Salina 1, on the Las Monas concession east of Cantagallo, is drilling below 2600 feet, scheduled to test formations around 10,000 feet. The Yanacue 1, a wildcat southwest of Cantagallo field on the same concession with the production is standing at 4215 feet, and Pedral 1, across the river east of the field is working with a bad fishing job at 9310 feet where drill pipe was stuck. The Sinu field now has two producers making about 85 barrels daily each.

Shell Tests

Shell has abandoned Chafurray 4, most southerly well in Colombia after reaching basement metamorphic rock at 2342 feet. Another location is to be announced soon. Also in the Llanos area, Shell's San Martin 2 is still testing after earlier reports to the effect that it would be abandoned following failure to show for a commercial producer from 200 feet of pay just above 6820 feet. Tests showed a small amount of heavy, 14-gravity oil. Regardless of the outcome of this well, Shell has announced that location is being selected for San Martin 3. In the Casabe field, Shell is now drilling its 44th well, and has 42 producers in the field. This area went on production the middle of last summer and has since averaged nearly 8000 barrels daily, which is delivered through Shell's own line across the Magdalena River for transportation through Andean National Corporation's line to Cartagena. In the Lower Magdalena Valley, Shell has drilled to 5100 feet in its 12th well after having abandoned Dificil 11 at 5670 feet with stuck drill stem.

Colombian Petroleum Company's activities on the Barco concession are largely confined to a program designed to expand and define the Tibu producing area. La Petrolea field, although still the largest contributor toward the Barco's 16,000 to 17,000-barrel daily output, is relatively settled production with little hope for expansion, whereas Tibu has become increasingly more important. Perhaps the most important test is Tibu 21-K previously mentioned as standing cemented at 10,555 feet. In all there are now four rigs running in the field.

Ecuador

TWO FIRMS LEAD OIL SEARCH

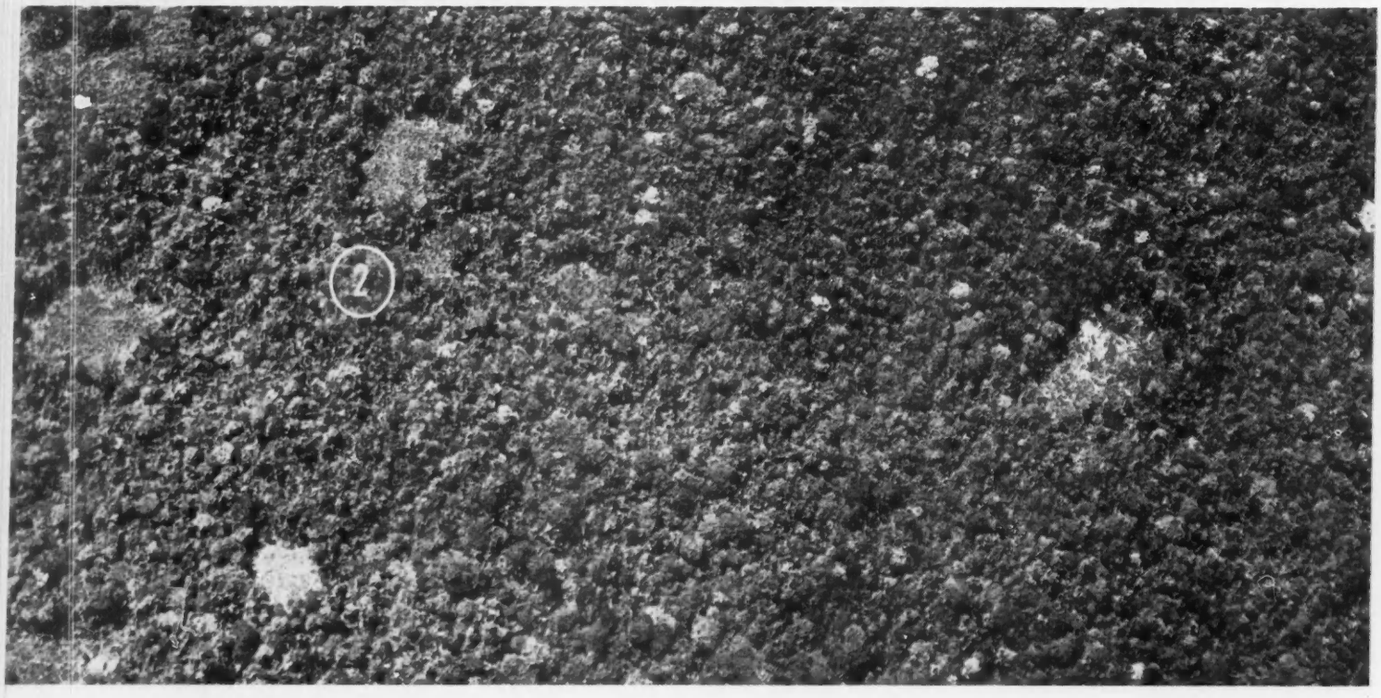
ALTHOUGH most of Ecuador's production is owned or controlled by Anglo-Ecuadorean Oil Fields, Ltd., the current search for new reserves is being largely conducted by International Ecuadorean Oil Company in the western portion, and Shell Oil Company of Ecuador in the east.

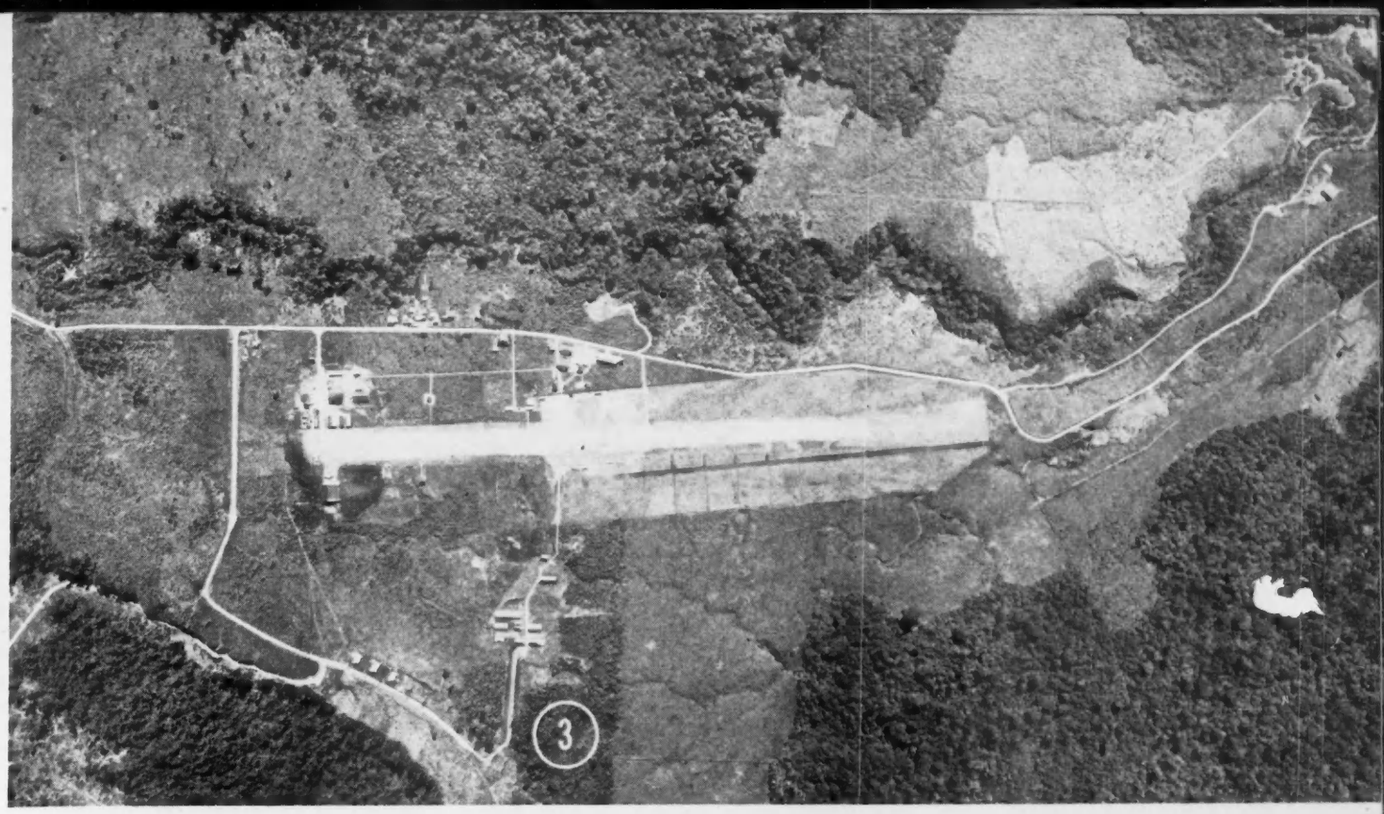
International Ecuadorean Oil Company has drilled seven wildcats in the west during several years since it became interested in acquiring and developing interests there, the most recent of which has established a new depth record for South America.

Three wells were completed in 1944, three in 1945, and another—the deep test—in 1946, the company having completed Bajada 1 on February 8 at total depth of 13,206 feet. Drilled in the coastal plains area in the province of Guayas, the scene of most of International's exploration to date, the deep test failed to show oil or gas, but plans are under way for drilling other deep tests. Three rigs are being maintained in the country for carrying on the work of prospecting, two heavy rigs and one medium duty setup. Only two of the seven wildcats have been stopped at depths shallower than 7000 feet, most of the work having been in holes drilled as deep as 7100 to 8400 feet. Several geophysical crews are working continuously in search of new prospects for drilling.

Shell is also carrying on geophysical work, and plans another well shortly to follow Vuano 1, which reported some non-commercial showings of heavy oil the latter part of 1945.

Recent figures on production indicate a decrease in output for the first quarter of 1946 as compared to the first quarter of 1945, with a still greater decrease from the last quarter of 1945. During the first three months of this year Ecuador produced 580,460 barrels, most of which went into domestic demand, although exports during the quarter amounted to nearly 93,000 barrels. During 1945, Ecuador produced approximately 7400 barrels daily average, of which 5400 barrels were controlled by Anglo-Ecuadorean Oil Fields, Ltd.





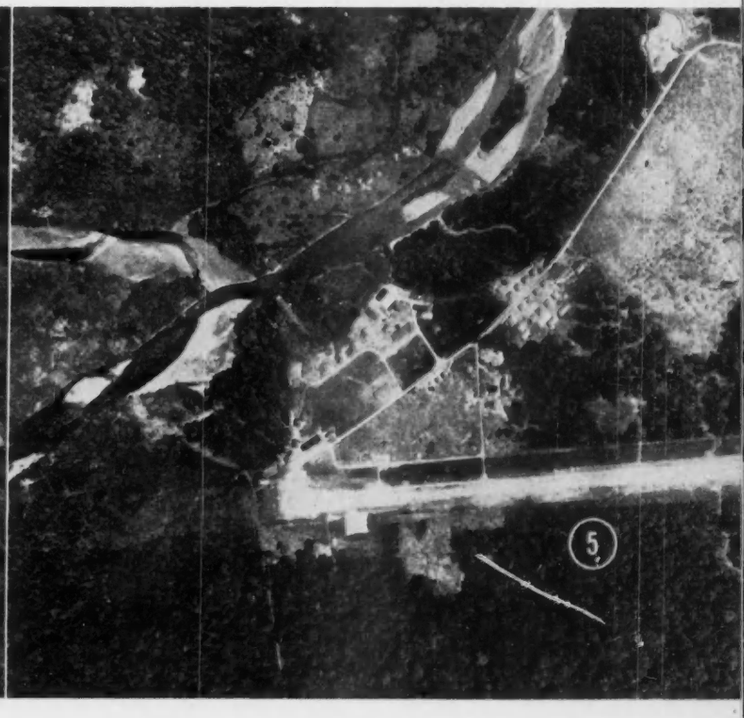
1. The Curaray River. A typical panorama showing the dense forest and meandering streams which extend to within 50 miles of the abrupt Andean mountain front. On such streams shallow-draft barges, four to five feet, can be used most of the year.

2. From the air, the only signs of life in this forest between the Napo and Curaray rivers are clearings of the Aushiri Indians, nomadic, savage tribes which impede oil exploration with poisoned spears and arrows.

3. Shell's main headquarters, Shell-Mera. This view shows the landing field, camp and road. From this field all supplies and materials for the drilling of Shell's Vuano 1 were flown to Arajuno.

4. Pujo, a small town and military camp which is Ecuador's easternmost outpost in the jungle. The Shell-Mera camp is five miles west of Pujo.

5. Arajuno, as the camp looked from the air when the first test was being drilled. Men, food, supplies and drilling equipment were flown into this base.



Guatemala

OIL POSSIBILITIES

By M. M. ADAMS, Geologist, Guatemala City

THE first known geological study of El Petén, Itzabal, and associated areas in Guatemala was made around 1860 by Dr. Carl Frederick Sapper, a German geologist-farmer of Cobán. His findings were included in his inclusive report and map of the Republic of Guatemala in 1865. It is this map which has served as the basis for all subsequent reports on this area.

Since 1865, many independent geologists have writen reports on this area, and with the growing petroleum production in Tampico, these reports have discussed the petroleum possibilities of these sections of Guatemala. Unfortunately, however, these reports all might be classed as hotel room reports, as none of these geologists ever explored the Petén area in person.

The first investigation made by a major company was instituted in 1925 by Standard Oil Company of New Jersey. That company commissioned Dr. Haines to make a survey of the area. However, the exploration went no further north than the highlands of Alta Verapaz. He subsequently based his report on the 1865 information of Dr. Sapper, calling the area inaccessible and unlivable during the rainy season, and entirely lacking in water during the dry season.

In 1935 and 1936 Shell Oil Company instituted the first comprehensive survey since the early work done by Dr. Sapper. This work was carried out for three years under the direction of Doctors Chapp and Wisser. This survey was extremely detailed, and was carried on in conjunction with an aerial survey conducted by Fairchild Aerial Surveys, Inc., which also included a complete study of British Honduras. In 1938, Shell, being unable to conclude further concession negotiations, withdrew from Guatemala, taking along all geological information with the exception of positive prints of the aerial survey. These prints are available for study in Guatemala. However, Shell took concessions on the neighboring British Honduras which in the knowledge of the writer are still maintained. The intention, however, was to return to Guatemala at a later date in order to gain better terms. This was prevented by the war.

In July, 1944, Standard sent a party directed by J. P. Gallagher and including the writer, to make a complete surface survey of the possible producing areas, using all available information. The Shell aerial photographs, and non-geological maps made from them were used as work sheets and base maps. This survey was carried on until August, 1945, when concessions were asked for but refused by the Guatemalan government's refusal to alter laws to meet the terms as set forth by Standard. The latter is now waiting till such time as the Guatemalan government may change the petroleum law.

Since August, 1945, no further work has been done in the Petén, Itzabal, and associated areas.

El Petén

El Departamento de El Petén is the northernmost state of the republic, being bounded on the east by a surveyed line marking the border of British Honduras (Belize on all Guatemalan maps); on the north by a surveyed line marking the border of the Mexican state of Campiche; and on the west by the rivers Río Salinas (Chixoy), and Río Usamacinta which mark the border of the Mexican states of Chiapas and Tabasco. The Guatemalan state of Alta Verapaz marks the southern boundary.

Petén has an area of 35.854 square kilometers (13,843 square miles) and a population of 11,475 inhabitants (figures as of 1942). The chief industries are the tapping of chicle trees, lumbering (mahogany and cedar), and intermittent farming on the part of semi-civilized Indians. The area is generally flat or undulating and covered by a growth varying from densely tropical near the rivers on the west, to heavily wooded sections in the central portions, to flat savannah grassland in the area immediately south of the Rio San Pedro, Lake Petén-Itza, and continuing east to the border of British Honduras. The towns of Flores, La Libertad, Fallabón, Santo Toribio, and Poptun are included in this area.

Primarily, Petén has been developed by the chicle industry. In building this industry the Chicle Development Company has also developed about ten airports serving this area. These ports are shipping stations for Chicle Development Company and Wrigley Import Company. All raw chicle is transported by air to United Fruit Company docks at Puerto Barrios. These ports are all equipped with two-way radio communication with Guatemala City, and are located at Flores (capitol of Petén), Paso Caballos, Carmelita, Uaxactún, Dos Lagunas, Fallabon, Santo Toribio, Poptún, Santa Amelia and Puerto Barrios. Puerto Barrios is the deep-water port maintained by United Fruit and the International Railroads of Central America. Also due to the development of the chicle trade there is a vast network of mule trails throughout the Petén area. Along the eastern Belize border there has been for years a lumber industry. This has involved the making of tractor and truck roads, and at this stage of development, the operating companies use large tractors and ten-ton trucks to transport mahogany over a well developed network of roads near the British Honduras border. The logs are carried by truck to the town of El Cayo in British Honduras, where they are floated down the Belize river to the ocean. There is also a partially-paved road connecting El Cayo with the seaport town of Belize, which is also the capital of British Honduras.

Topographically, El Petén is a flat, low-lying extension of the same formations found all around the littoral of the Gulf. The same beds are found in Texas, Tampico and the Yucatán Peninsula, of which El Petén is a southern continuation. The area ranges from a low in altitude of 105 meters (344 feet) at Lake Petén-Itza, to a high of 450 meters (147 feet) at the head of the Río Passión.

The area is structurally and lithographically divided by a definite line running east-west across Petén and marked topographically by the Río San Pedro, Lake Petén-Itza, Lake Yashá, and smaller bodies of water extending into British Honduras. The area north of this line is structurally marked by a series of northeast-southwest striking faults, which are topographically demonstrated by a series of escarpments and northeast flowing streams draining through Mexico and British Honduras. The area south of this line is a continuous series of structural undulations which extend south till they are finally upturned against the mountain front in Alta Verapaz.

In the Alta Verapaz the sedimentary series of Petén are upturned against the igneous rocks which comprise the geology of that section. At the moment the presence of lead-zinc minerals in this contact area has prompted a large-scale mining exploration program.

Almost all the area is covered by

Map of Guatemala showing the Departments within the Republic. Most favorable structures are near Santo Toribio and Chinaja in the Deparement of Peten in Northern Guatemala. Peten has an area of about 13,843 square miles.

limestones ranging in age from carboniferous (probably Permian) to Miocene. Along the rivers on the west side of the area there are also marine and non-marine tertiary shales, most of them Miocene in age. The lowest of the limestone series upturned against the mountains of Alta Verapaz is a carboniferous black lime (Permian), which is highly broken up, and gives fetid and pertoliferous odors on fresh fracture. Various seepages have been reported in this area but have never been observed by the writer. Overlying this carboniferous bed, and also upturned against the mountain front, are the Cretaceous beds. These beds are very cavernous, and the limestone itself is very hard and aphantic, with excellent microfossil and lithological determination. This bed is in all probability the same formation as the Tamasopa lime of Tampico and the Edwards lime of Texas, and would be the source bed of petroleum production in Guatemala. This also is the uppermost of the upturned beds. The overlying formation is an Oligocene limestone. This formation is composed of crystalline to granular limestone, with marl interbeds. This limestone has poor micro-fossil determination, and some indeterminate megafossils, but is easily identified on lithology. This formation covers a large part of Petén, and would be the capping of any structure. All these formations can be followed into British Honduras and Mexico.

North of Lake Petén-Itza a Miocene gypsiferous limestone is faulted into the Oligocene formations to the south of the lake. This is observable by the existence of escarpments and massive beds of gypsum. Fossil determination is poor, but lithologically easy. The almost non-existence of fossils and the presence of such massive beds of gypsum indicates a period of non-marine deposition.

Historically, it could be concluded that this area was a synclinal basin during carboniferous time, as indicated by the carboniferous limes upturned in Alta Verapaz and the presence of hard carboniferous shales underlying the cretaceous near El Cayo in British Honduras. This then was followed by a period of emergence, with no deposition, until the beginning of Cretaceous time, when submergence and deposition again took place. This trend continued through Miocene time with various periodic movements as indicated by the presence of marine and non-marine shales. At the end of the Miocene a general uplift took place, the mountain-making activities in the south uplifted the beds in the Alta Verapaz, and the faulting took place north of Lake Petén-Itza. Since that time the area has remained as it is today except for erosion.

In El Petén there are two known closed structures; one near Santo Toribio and the other near Chinaja. Aside from these two there are several structural arches; however, these are not closed and are not considered as likely as the two above-mentioned areas, for possible petroleum production.

Santo Toribio, the largest and the most likely structure, is a closed anticline lying north of the Santo Toribio savannah. With its high end near the British Honduras border, it strikes southwest across eastern Petén. The north flank is faulted into the Miocene gypsiferous-limes of northern Petén.

The southern flank is in unconformable contact with an upper-cretaceous of lower Eocene limestone which is dense and different in character from the other limes of the area. In this structure the necessary elements for oil production exist. Source beds are accounted for by the upturned carboniferous limestones in Alta Verapaz, and more directly by the nearby carboniferous shales found in direct contact with the Cretaceous, across the border in British Honduras. The reservoir should be the cavernous limestones, which are so similar to the Tamasopa and Edwards limestones. The Oligocene limestone and marl beds should serve as the capping. The probable depth of this Oligocene bed is judged to be from 3000 to 4000 feet, although the depth may be considered conjectural.

Most Accessible Area

Of the two Petén areas this is the most accessible. The nearby town of Santo Toribio, about ten kilometers (6.2 miles), from the axis of the structure, is served by an airport and radio communication. It is also not more than 25 kilometers (15.5 miles) from the tractor and truck roads of the mahogany operations in eastern Petén. As stated previously, these operations are served by river and road from the sea coast. By these means, heavy equipment could be transported to its location on this structure.

Chinaja Mountain presents the most perfect completely closed structure in the area. However, it is the least accessible, as it is located in the extreme west portion of Petén, on the border of Alta Verapaz. It is characterized by very steep dips and sharp flanks which rise some 500 to 1000 feet above the surrounding territory. The structure is completely disconnected from any nearby geological feature. It strikes west and is approachable from the west on the Río Salinas. This is accounted for by the fact that the top of the mountain has been eroded away and stream drainage down the axis to the river has exposed a covering of Oligocene limestones and marls on the mountain. The presence of the usual limestone (Cretaceous) in the north in Peté, and upturned against the igneous mountains to the south in Alta Verapaz, indicate that production could again be expected from the Cretaceous limestone.

This area of poor accessibility can be reached with heavy equipment by road from Guatemala City via Cobán, to Sebol and thence by river to the flanks of the structure. However, it is easier to reach by bringing equipment through British Honduras, through Petén to Flores and then by river to the axis of the structure. Both methods, however, would be long and difficult jobs.

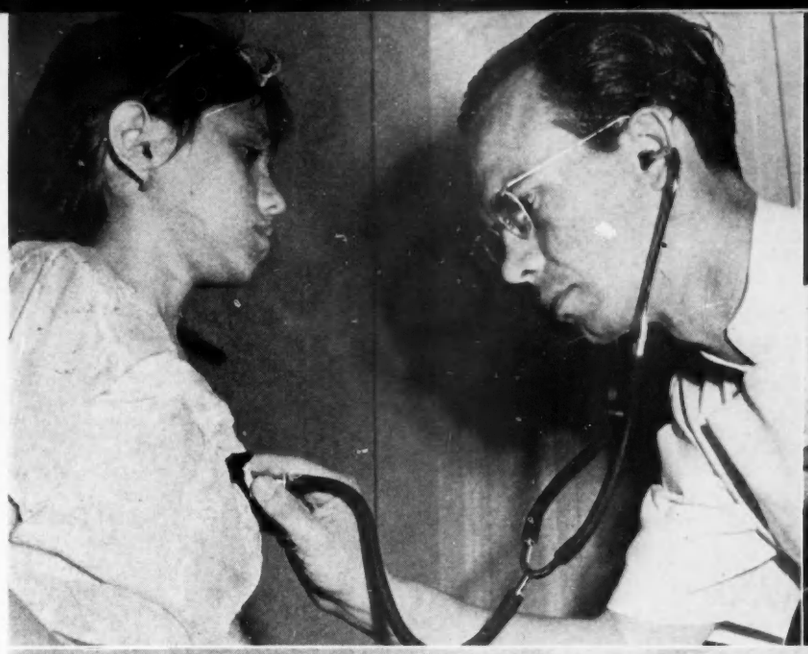
El Departamento of Itzabal is on the Atlantic Coast of Guatemala. It is bounded on the north by the Sarstún River and British Honduras, on the east by the Gulf of Mexico, on the west by the State of Alta Verapaz, and on the south by the Republic of Honduras. Lake Itzabal is included in this area.

The area of this state is 6154 square kilometers (2376 square miles) of which a third of the area has petroleum possibilities. This is the area north of the lake. It is sparsely populated, with a little agriculture and some lumbering as its chief industries.

This area is very accessible, having deep-water transportation to the Atlantic Ocean, both in Lake Itzabal and the Sarstún River. It is also a half hour by boat from Puerto Barrios, which is the termination of the railroad and has port facilities maintained by United Fruit.

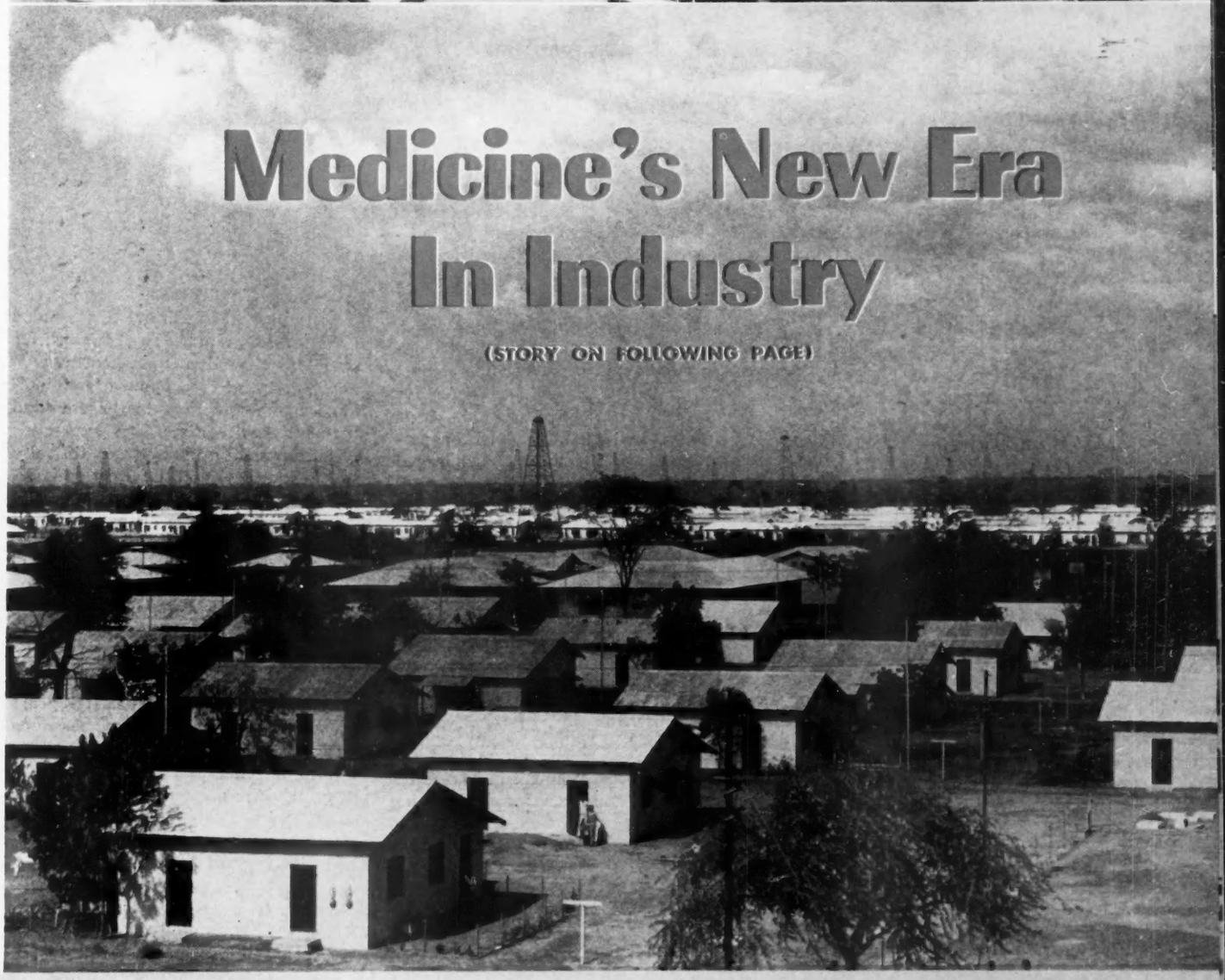
This area is a southern extension of the same formations which exist in El Petén and British Honduras. However, the formations here are not upturned as they are in the Alta Verapaz. The most prominent formation is a Miocene limestone which is marine and chalky in character. Rivers flowing over the area have exposed tertiary shales which overlie the limestone, and also the same Cretaceous limestone found in the rest of the Petén area. The shales as usual vary from marine to non-marine. Wherever erosion has taken place, individual anticlines have been exposed. In all probability these are part of the same general structure. The lake marks the contact of the sedimentary series which is unconformable with the schists and igneous rocks which appear on the south side of the lake. Here one might expect production from the Cretaceous beds with the overlying Oligocene and Miocene sediments as a capping.

Because this area is the most accessible of the possible structures it has been subject to several promotions, all unsuccessful. According to Shell and Standard, however, this section does not have the same possibilities as the areas of Petén. Also, because the overlying Miocene beds have not been eroded, as they are in Alta Verapaz, production should be expected at much greater depth.



Medicine's New Era In Industry

(STORY ON FOLLOWING PAGE)



Top left: **A basic part of the medical program in foreign lands is regular physical checkups of oil company personnel and families for prevention of illness and maintenance of health.**

Top right: **Students of industrial medicine stress training in proper sanitary methods of handling and preparing food.**

Lower photo: **An industrial preventive medical program for operations in foreign countries should include provision of proper housing and sanitation facilities.**

MEDICINE in industry today is entering a greatly broadened field of service. It is a field that has been opened in the last few years by the steady advancement of medical science and the development of new concepts by industry regarding its obligations to the individual.

The doctor in industry long ago passed that almost primitive stage where he was expected only to give first aid—to apply bandages or splints. Today, medicine in industry recognizes the need of helping an employe maintain good health not only for his working years but for as long as possible after his retirement.

In moving toward this goal, the medical department of Standard Oil Company (New Jersey) has progressed from as office with one part-time physician to a world-wide organization having 32 hospitals and more than 150 physicians and 1500 nurses and attendants.

This growth resulted from 28 years of pioneering by both management and medicine. And we are still pioneering. Whether it's in the oil fields in the tropics or in the office of a Manhattan skyscraper, we are constantly searching for better means of protecting and maintaining health.

Varied Problems

In an organization where men necessarily operate in varied climates and under vastly different conditions, there are bound to be multiple medical problems. The medical requirements of the sales group, for example, differ from those of the refining groups. And the health needs of the oil workers in Venezuela are not the same as those who have clerical duties in the company's city offices. Yet each is entitled to the best medical care we can give.

It is the duty of the physician in industry to prevent illness and to maintain health. But it should be remembered that the employe, too, must accept some personal responsibility for his physical welfare. That is especially true in the newer field which medicine in industry is now entering—the field of constructive medicine.

Constructive medicine is the improvement of general health. Not by any means will it supplant preventive medicine in our industrial medical departments. Instead, it will be an extremely important adjunct to preventive medicine—helping to make the work of the doctor in industry much more effective.

In preventive medicine, the physician seeks to prevent illness. In Venezuela, for example, our company provides employes with modern homes, hospitals and dispensary facilities as part of its health and sanitation program for the workers and their families. The hospitals and dispensaries are staffed by Venezuelan nationals—physicians, surgeons, dentists, nurses and laboratory technicians.

By
DR. ROBERT COLLIER PAGE
General Medical Director, Standard Oil Company (New Jersey)

These men must be constantly on the alert in the long-continuing war against malaria and other tropical disease. They conduct malaria clinics and mosquito eradication projects and, as a result, have been quite successful in reducing malaria materially in the oil communities.

The company also has built water purification plants, laid miles of water mains to bring pure water to the oil workers, and has installed extensive sewer systems. Inoculations against typhoid and vaccinations against smallpox are now routine procedure.

At the headquarters of Jersey's medical department at 30 Rockefeller Plaza, as well as in the oil field and elsewhere, a new employe is given a thorough physical examination to protect him against being put to work at some job for which he is physically unsuited. He is offered the best medical advice on personal health problems and encouraged to seek our aid for any ills.

Medicine in industry has come a long way in the last two decades. It is winning the war against occupational diseases; by working closely with maintenance and operation departments it has taken elaborate precautions to check new operations for possible hazards to workers; it has helped to eradicate sources of disease and infection at home and in foreign lands.

But medicine in industry still has a tremendous task ahead. The present approach to preventive medicine must be expanded and research into improving methods of sanitary science likewise must go forward. For while preventive medicine has done much in controlling many diseases common to childhood, thus far it has accomplished very little in the prevention and retardation of the so-called degenerative diseases of the adult, such as cardiac disturbances and certain metabolic disorders.

Foreign oil workers are among those who are benefiting by medicine's greatly broadened service

Constructive Medicine

This is where constructive medicine enters the picture. Constructive medicine includes the prevention and control of disease and its foundation is the periodic health examination.

Only a qualified examiner is capable of performing the thorough job necessary. Many such personal examinations in the past have been too hurried, too superficial. To attain the maximum effectiveness, the examinations must be individualized and the search for information by all possible avenues is a requisite. The examiner must learn the history of the individual, make special functional tests and call frequently upon the laboratory technicians..

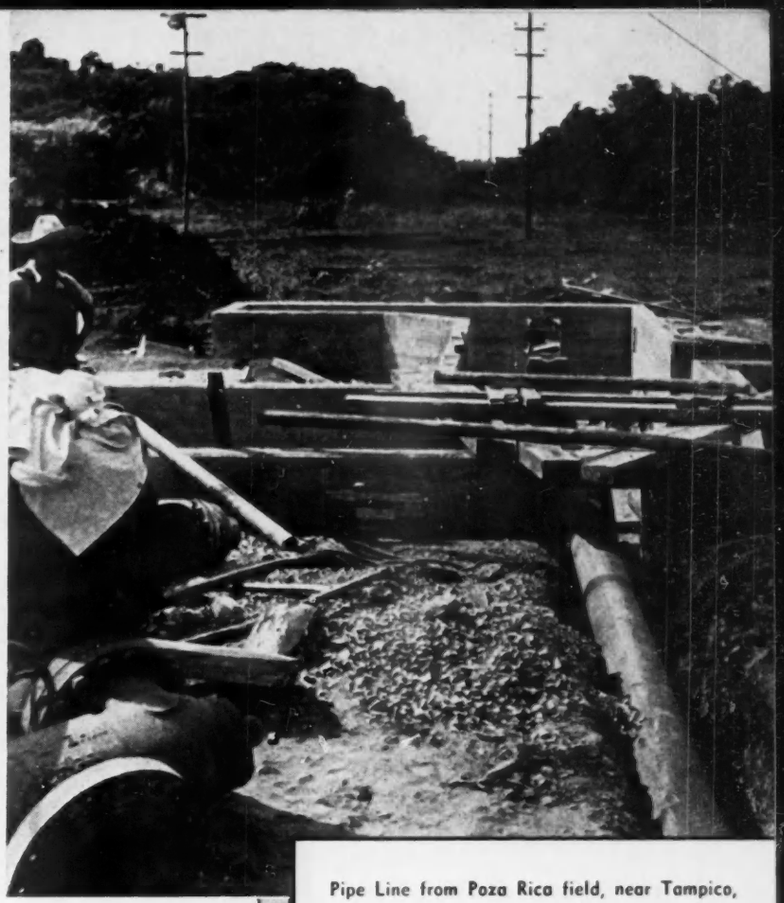
This type of a constructive medical program is expensive, of course. It involves considerable time, much scientific equipment, and a high level of diagnostic acumen on the part of the physician. But its costs are readily justified on economic grounds.

We cannot always calculate the value of the services of our key personnel, for example, but modern management well knows that the experience of an individual which conditions his wisdom and judgment requires time. The greater his specialization, the greater the difficulty in replacing him. And the greater his responsibility, the heavier is the wear and tear on him. For these reasons, it certainly seems that the best medical supervision and advice should be available at all times to all employes.

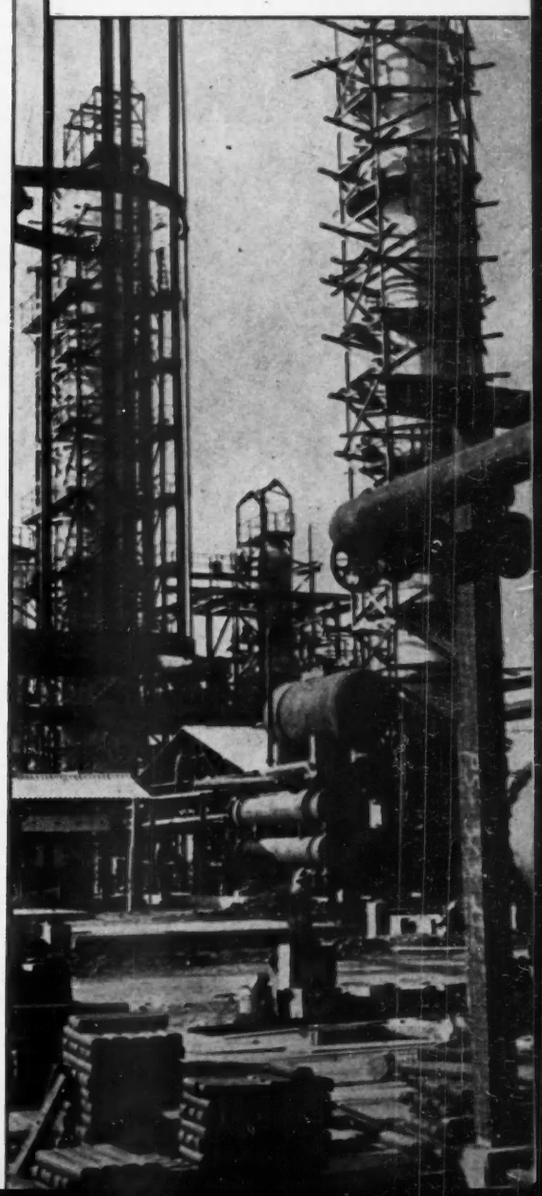
I am convinced also that in the coming era medical men in industry will practice constructive medicine as they recognize more and more the growing importance of health in the later years of a man's life. Our company has done a great deal in the last few years to stabilize incomes and prepare the employe for retirement with a comfortable annuity. It is the responsibility of the medical department to help those employes enjoy their retirement as long as possible.

To accomplish this we must, of course, have active help on the part of the employe. He must be educated to seek regular medical advice even before he experiences pain. Guidance in nutrition, regulation of exercise, instruction in cleanliness and advice regarding wiser living habits have developed healthier children. And it is logical that the health of adults so guided would be profoundly improved and for a greater period of time.

Pemex Doubles Azcapotzalco Refinery Output



Pipe Line from Poza Rica field, near Tampico, to Azcapotzalco.



New additions at Azcapotzalco refinery.

PETROLEOS MEXICANOS (Mexican government-controlled oil company) will have doubled its daily production at the Azcapotzalco refinery near Mexico City by mid-summer through construction of new refining units. Construction was started in September, 1944, on the units, which will be devoted to production of high-octane gasoline.

Because of the increased internal consumption of gasoline and petroleum products brought on by war conditions, Efrain Buenrostro, director general of Petroleos Mexicanos, initiated plans for the expansion program at Azcapotzalco in 1940. The Mexican oil industry, which had been designed and developed especially for exportation of oil, was not prepared to meet new domestic demands for gasoline, diesel oil, fuel oil, kerosine and other hydrocarbon derivatives. It was necessary to redesign and modernize the Mexican oil refining industry for the internal welfare of the country.

Modernization Plan

A ten-year plan for modernizing the industry was advanced by President Avila Camacho. Besides the new units at Azcapotzalco, the president proposed construction of a new refinery at Salamanca, State of Tamaulipas, to utilize crude brought by a pipe line from the Poza Rica fields near the gulf port of Tampico, and construction of a new refinery at Monterrey to supply that industrial center with gasoline, natural gas and other fuels.

Before expropriation of foreign oil interests in March, 1938, about 85 percent of Mexico's petroleum was exported and only 15 percent consumed internally. However, by 1946 these ratios almost had been reversed, while facilities of the industry remained practically unchanged. A serious shortage of gasoline and fuel oils resulted.

The new additions to the Azcapotzalco refinery will occupy about 150 acres adjacent to the old plant. Production will be 20,000 barrels daily of fuels of various octanes. Actually, the new plant consists of five units, primary distillation, thermic disintegration, polymerization, isomerization and alkalization.

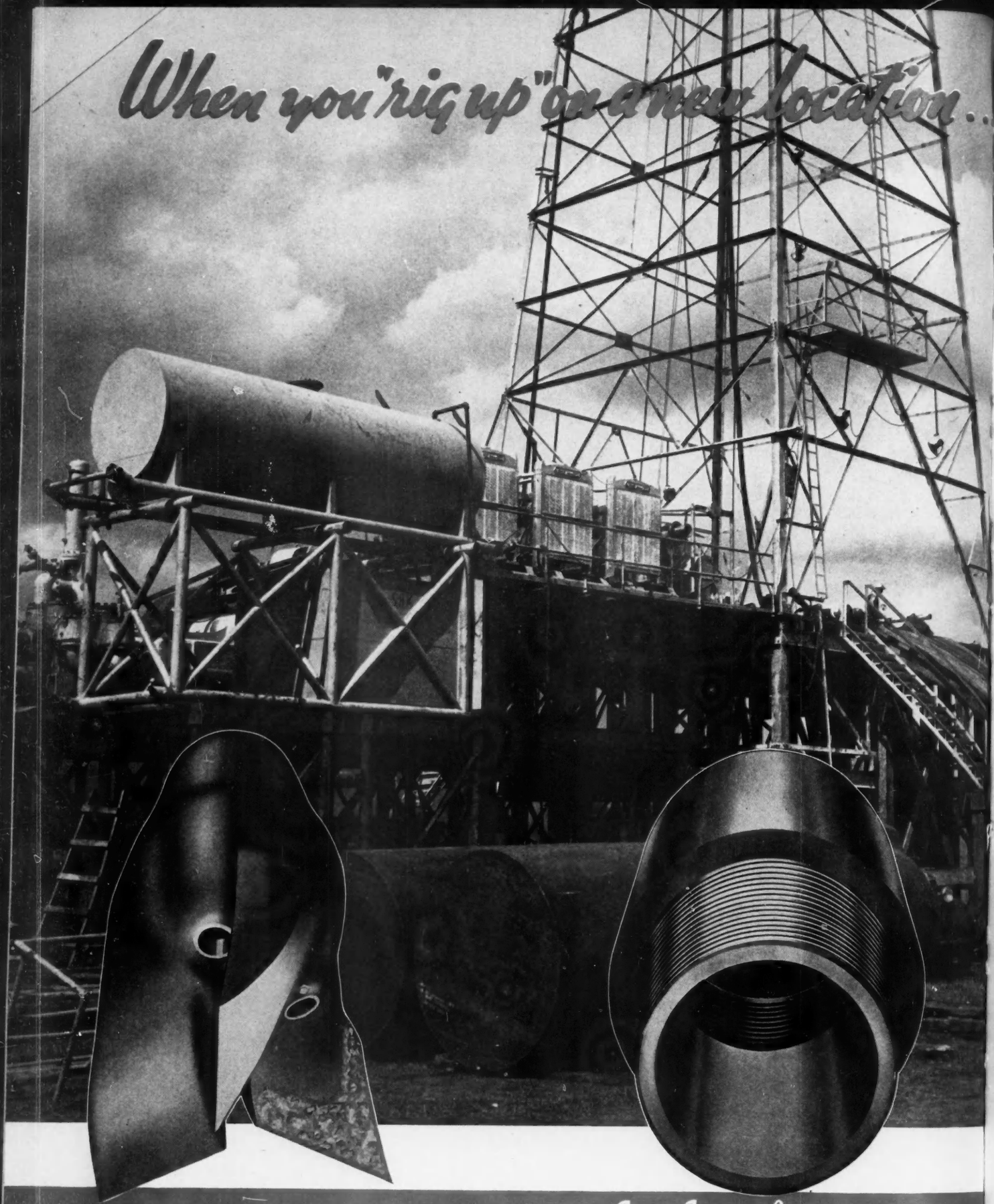
To Ease Shortage

Immediate benefit of the new units will be relief of a gasoline shortage in Central Mexico. Quite often a 24-hour strike at the old refinery causes an immediate gasoline shortage in Mexico City and the Federal District.

Director General Buenrostro reports that original plans for the Azcapotzalco construction called for an outlay of about $19 million but by May 1, this had increased to $21 million.

General superintendent of the refinery is Carlos Ziegler, a graduate of Massachusetts Institute of Technology. Ziegler was formerly superintendent of the Petroleos Mexicanos plant at Minatitlan and was also chief of the laboratories of El Aguila Oil Company before expropriation.

Antonia M. Amor, chief of the projects department of Petroleos Mexicanos, designed the Azcapotzalco additions.



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Socialized Oil Plans Delayed by British

By HENRY OZANNE, Staff Writer

ANNOUNCED plans of the British Labor government to socialize basic industries, including petroleum, have been drastically modified, in the opinion of industry representatives in the United States who have studied the proceedings of the recent British Labor Party convention at Bournemouth, England. In fact, two fundamental principles of the British government's program are now clear, and both are accepted as evidence of deep alteration in the party's "socialization" program:

1. Nationalization in England is to be piecemeal, "experimental," more protracted and far less extensive than formerly was proclaimed by the British Labor Party theorists. Only a few industries are named as objectives of socialization in the most recent party pronouncements, and cabinet members have leaned over backward to emphasize that private enterprise and initiative still have a large—perhaps the major—role in the postwar reconstruction of the British Commonwealth.

2. The petroleum industry particularly will not be an immediate target of the British nationalization program.

Oil's Future

During the last year, American and British oil industry representatives alike have been speculating on what the British government intends to do with petroleum. At last that question appears to have been fully answered by Emanuel Shinwell, British Minister of Fuel and Power, who was one of seven cabinet officials who addressed the British Labor party sessions. The party congress is always a political soundingboard for the type of legislation that will be sponsored in the immediate future. When the Laborites assembled, Herbert Morrison, Deputy Prime Minister, announced that the government would call for the nationalization of the chemical, petroleum, fishing and agricultural industries of Britain. He said that he had held private, off-the-record conversations with members of the Fabian Society toward bringing all four of these industries into Labor's platform for the 1950 general elections.

The inclusion of petroleum in the industries cited by Morrison is now considered "window-dressing," but it brought prompt repercussions. Morrison was seeking to show that (in his words) "economic planning machinery is being developed rapidly." He added: "We are going to show the whole world how the problem of combining democratic freedom and economic planning is to be solved." Nationalization, in his opinion, "could provide new and fine incentives born of new and fine public services." Industry observers feel that it must have been sheer inadvertence that he mentioned oil. At any rate, Shinwell told the party the following day that "oil is one of the most sticky problems the government has to consider," and made it clear that no petroleum nationalization is in the picture at this time.

The conservative *London Times* reported the episode as follows:

"When Mr. Shinwell set before the conference the large picture of the nationalization plans, he also had a warning to give. The party platform slogans and the sketchy plans which were all that they had when they came into power, would not do for the future. Careful preparation was required before they embarked on adventurous industrial experiments."

Socialism's Test

Shinwell further set the tone at the party conference when he declared that the nationalization of the mines would be the test of British socialism. "If this fails," he said, "we cannot expect to promote further schemes of nationalization."

He hinted that "international complications" attended any effort to nationalize petroleum; and, furthermore, he said, "nationalization is only the fringe of economic policy—nationalized industries must not be subsidized by the Exchequer."

All this contrasts sharply with previous pronouncements of the British Labor Party and the party's uncompromising demand for socialization of all industries. Now, as against only a year ago, the purpose of the British Government, says Morrison, "is to stimulate a real economic drive and to apply the doctrines of economic expansion together with maintenance of economic stability."

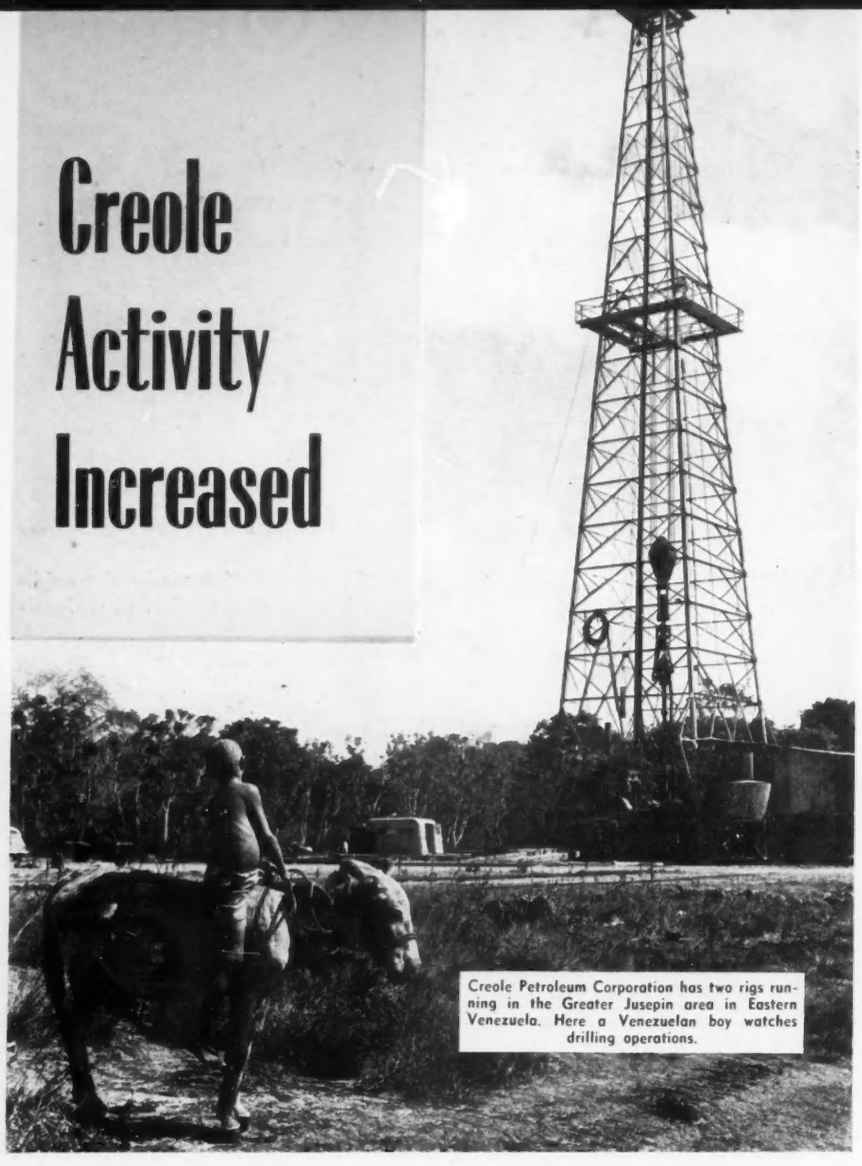
Even the reassuring statements of party leaders failed to bolster completely the British stock markets. Investors have long been concerned with the problem of nationalization, and it is their belief that the government has postponed socialization in any meaningful form. According to Shinwell, the test of nationalization lies in the coal mines and that "experiment" is still doubtful—the result of state ownership in this sphere cannot be determined for perhaps years. British capital meanwhile continues hesitant.

In short, the British experiment in socialization at the moment appears to be taking the same course as in Russia 15 years ago—an increasing recognition that private enterprise cannot be uprooted, and a readiness to face the real situation while still retaining the verbal symbols of revolutionary change. In such a context the petroleum industry is certainly handicapped, but hardly threatened.

If nationalization of the industry is undertaken in England, it probably will affect production in England only—a dribble of 500,000 barrels yearly now, but almost certainly it will not affect the operations of Shell, Anglo-Iranian and other British interests abroad. The Labor party's socialization program has a large "nuisance" feature to it but cannot now be considered as imperiling British oil operations any place in the world.

Labor's policies may handicap but do not threaten the oil industry in foreign fields

Creole Activity Increased



Creole Petroleum Corporation has two rigs running in the Greater Jusepin area in Eastern Venezuela. Here a Venezuelan boy watches drilling operations.

CREOLE Petroleum Corporation has begun its greatest exploration program in the company's history and is now employing 85 percent more men in this work than a year ago, with double the number of field survey parties used in 1945, Arthur T. Proudfit, president, told Creole stockholders at their 1946 annual meeting in New York recently. Proudfit reported:

"During this year and next, we expect to find most of the new oil through wildcats and stepout drilling in our exploration concessions. On the other hand, we will pursue vigorously the search for oil in our new exploration concessions acquired in 1944 and early in 1945. These concessions total 1,185,970 acres. The largest holding is in the state of Guarico in Central Venezuela where we have two blocks totaling 784,290 acres. The exploration period on these runs to November, 1947."

A second holding of 296,525 acres is in Lake Maracaibo where the exploration period runs to January, 1948; and a third consists of 105,155 acres in the State of Monagas, eastern Venezuela. This area is north of the Jusepin field, and the company has until April, 1948, to select exploration parcels.

"In all three of these regions," said Proudfit, "geological exploration wells are being drilled for structural control to permit the selection of strategic locations for deep wildcat wells. Three rigs will drill 11 locations in Lake Maracaibo, four rigs will drill approximately 12 exploratory holes in Guarico and two rigs will drill five holes in Monagas.

"In addition, three seismograph parties, two gravity meter crews, and two geological crews are working in Guarico, one gravity meter party in Monagas, and one underwater gravity meter party in Lake Maracaibo.

"We have three rigs drilling deep wildcat tests in Eastern Venezuela. Two of these are working in the Greater Jusepin area and one is drilling south of Quiriquire field."

In the past year Creole has drilled three more wells to find the eastern extension of the deeper Jusepin sands, and will drill one more this year.

"We have two other exploration areas which I did not mention with the other three," said Proudfit, "as they enjoy a special status. They were held under an old petroleum law but were converted under the 1943 law with a special term of six years for selection of exploitation parcels. Three of these years are tax-free. These areas total 1,070,482 acres in the state of Falcon, western Venezuela, and are known as Buchivacoa 1 and 2, and Gueque 1 and 2. We are just beginning the topographical survey this year. In the Gueque area a wildcat well will be drilled this year."

Creole has completed centralization of its geological laboratories at Caracas, and thus will be able to save much time in acting on new information coming from the exploratory wells and field parties. The geological and paleontological laboratories also have been enlarged as the company finds regional geological studies are becoming increasingly important. The finding of new oil is growing more difficult in the Maracaibo and Lower Orinoco basins because in most cases drilling must now be done through unconformities, necessitating a substitution of geological studies and exploratory drilling for geophysics in many cases.

Creole has resumed its aerial photography work and has photographed its new holdings, "thus facilitating our work through the use of the relatively new science of aerogeology."

From September, 1939, to August, 1945, Creole increased potential production from 363,845 barrels daily to 558,950. "Actually," Proudfit explained, "we have gone on to increase our potential to 570,630 barrels a day as of May 1. On the basis of normal development of demand, and taking into account the quality and amount of crude oil that Venezuela can supply at competitive prices, it now appears that Creole's production should hold to the present level for some time."

During the first three months of 1946, Creole gained 30 percent in net production, including purchased royalty oil, with an average of 517,000 barrels a day compared with 397,000 for the first three months of 1945. The industry for Venezuela was slightly more than 1 million per day during that period, hence Creole's percentage of production for the quarter was 51.5 as against 51.1 for 1945.

The company's total earnings for the first quarter were $24 million after deductions for taxes. In 1946 Creole will spend about $50 million on plant additions. Included in the expansion program is the construction of the new refinery on Paraguana peninsula in Western Venezuela, on the shore of Amuay Bay, "providing we can arrange for an adequate supply of fresh water." It may be necessary to go 75 miles for this water, and negotiations for the pipe line right-of-way are now in progress. The refinery will be completed in 1948.

Poland's Oil Problems and Plans

DEPRIVED of the predominant portion of its prewar production and reserves, as a result of annexation by Russia of the eastern portion of Poland, the Polish oil industry faces many difficult and complex problems. Interesting information on what these problems are and how they are being met is contained in *Nafta*, an official monthly organ of the C. Z. P. P. P. (Central Governing Body of the Industry of Liquid Fuels) published by the Polish Petroleum Institute. This article is based on data presented in this publication, several issues of which arrived recently in the U. S.

New reserves is greatest problem in a land facing task of healing war's destruction

Summary of Problems

Most important problem facing the Polish petroleum industry is finding and development of new reserves. This is needed primarily to satisfy the domestic demand of a country confronted with the task of repairing through devastation by war. Statistics available in the U. S. on Polish oil production during the war years are only estimates. The last available accurate figures on a full, normal year are for 1938. During this year crude production of Poland amounted to 3,763,000 barrels. During 1945 production of fields, within what is now considered Polish territory, amounted to 770,377 barrels, and (Table 2) therefore represented around 20 percent of the prewar total. Natural decline of the fields and war destruction are, of course, some of the contributing causes. The primary cause, however, can be readily seen on the map (Figure 1), with most important fields, like Boryslaw, Bitkow, Schodnica, Majdan and Rypne, now in the territory of the U. S. S. R.

The campaign to maintain present production and develop new reserves is, for the time being, carried out with a minimum of equipment. Large quantities of instruments, tools and machinery have been destroyed or taken out of the country. Rebuilding of equipment inventories is a primary requirement and is difficult under present conditions of the European supply and in the present financial condition of the country. Maintenance of production is further hindered by unsettled conditions within the country. Official cognizance is given by *Nafta* to the effect on efficiency of operations of sabotage and "bandit activity."

All these difficulties are aggravated by the fact that the Polish oil industry is now undergoing reorganization incidental to the nationalization, by the Polish government, of all the basic industries.

Nationalization

All branches of the petroleum industry have been nationalized. Without compensation the state is taking over the properties of the German Reich and of the former Free City of Danzig, the properties of the citizens of the Reich and of the German citizens of Danzig and of the persons which went over to the side of the enemy. Compensation for properties of others is to be determined by special commissions. In determining the value of the properties, these commissions have to consider general depreciation, war damage sustained since September 1, 1939, new investments made since that date, and all the special circumstances which may have bearing on the value of the properties. Interested parties have a right to participate in hearings before these commissions and may request the appointment of experts for the purpose of establishing the true values.

The nationalized properties are taken over in their entirety. Included, are patents, licenses, trademarks, etc., owned by the nationalized firms. The compensation is to be paid to the former owner within one year from the date he is officially advised of the amount of compensation. Normally, the compensation is paid out in securities; in exceptional cases it may be paid out in cash. Confiscation of properties and severe penalties are provided for those who attempt to remove, hide or damage the properties to be taken over.

The state may manage and operate the nationalized properties or it may transfer this right to cooperatives or to associations of cooperatives.

Drilling Operations

Table 1 gives data on drilling operations. Of particular interest is the slow progress of drilling as evidenced by the monthly footage drilled and number of rigs in operation. The primary cause of this slow progress is continuous shut downs, occasioned by lack of materials and difficulties of supply.

Interesting also is the gradually increasing number of exploratory drillings. As far as completions in the proven fields are concerned, the data for the four-months period, here reviewed, indicate shallow wells of the stripper-type class. The depth of these completions ranges from 500 to 3900 feet and the size of initial production from seven to 30 barrels per day.

Production Data

Figure 2 and Table 2 show, respectively, production data for the period from January 1, 1945, to April 1, 1946, and

TABLE 1
Polish Drilling and Completion Data

MONTH	NO. WELLS DRILLING		NO. FEET DRILLED		NO. WELLS COMPLETED			
	New and Workovers in Proven Fields	Exploratory	New and Workovers in Proven Fields	Exploratory	New and Workovers in Proven Fields		Exploratory	
					Prod.	Dry	Prod.	Dry
November, 1945	43	3	4293	148	3	2	....	....
December, 1945	44	4	3336	79	....	2	....	....
January, 1946	44	5	3867	239	6	3	....	....
February, 1946	39	6	4379	607	6	1	....	....

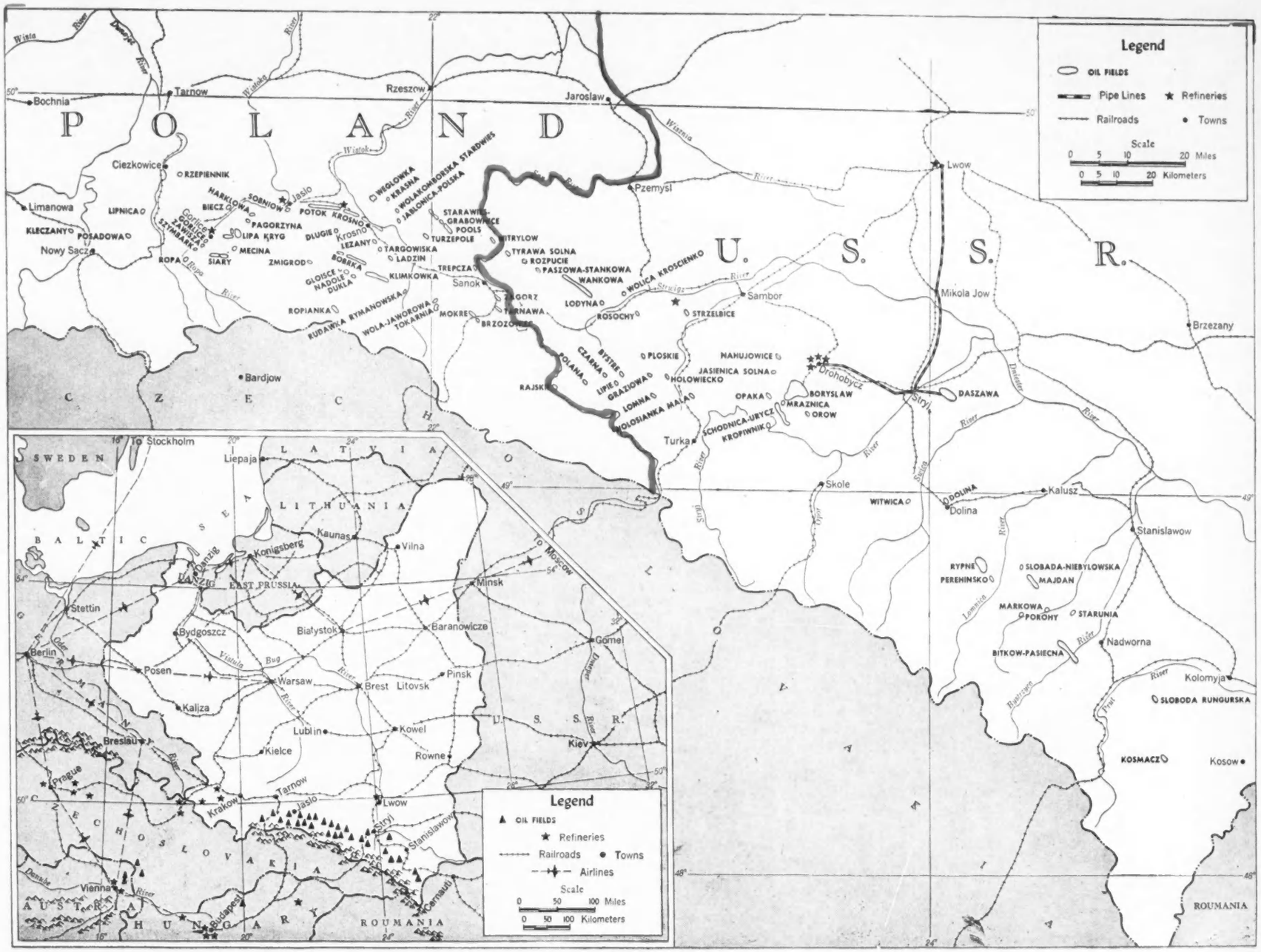


Figure 1. The USSR has taken approximately half the oil fields of Poland, including the better fields. The red line on the map shows the approximate location of the so-called "Curzon line" through the Polish oil area. The USSR now controls the area east of that line.

data for the four-month period reviewed.

Figure 2 indicates that during the first months of 1945 considerable increase in production was attained, probably by restoring to production a number of wells damaged by war. After that the average production appears to be pretty well settled. It should be noted here that only 3 percent of all the oil produced during 1945 was contributed by the wells drilled during this year, the remaining 97 percent having been produced by wells drilled prior to January, 1945.

In February, 1946, there was in Poland a total of 2295 producing oil wells, 45 gas wells and 226 wells standing. This represents an average crude production of .93 barrel per well-day. From the standpoint of methods of production the oil wells may be classified as follows: 7 wells flowing, 2 wells on gas lift, 171 wells swabbed or bailed, 2115 wells pumping.

Refining, Natural Gasoline, Imports

Table 3 gives data on activities of refineries and casinghead gas plants. The domestic crude supply is being increased by import. Contracts have been signed with Roumania for delivery of 220,000 barrels of crude by October 1, 1946, and with Hungary for delivery of around 300,000 barrels of crude by the end of the year.

The most important factor in importation of crude oil products are the deliveries of UNRRA. It is estimated that during 1946 these deliveries will amount to around 440,000 metric tons of motor fuel, avaition gasoline, different types of lubricating oils, etc.

Plans for the Future

Reports on recent accomplishments and outlines of plans for the future, as presented by *Nafta,* reveal the determination and enthusiasm of a group of individuals who set for themselves as a goal the restoration of the Polish oil industry to its prewar position and, later, further improvement of this position. The impression is gained that this enthusiasm and determination have nothing to do with the political doctrines or the new system under which the Polish oil industry is to operate. They seem to be prompted primarily by the fundamental desire to be of service to the country through the rebuilding of the oil industry. The motto appears to be to try to do as much as possible with what little is available and then hope for the best.

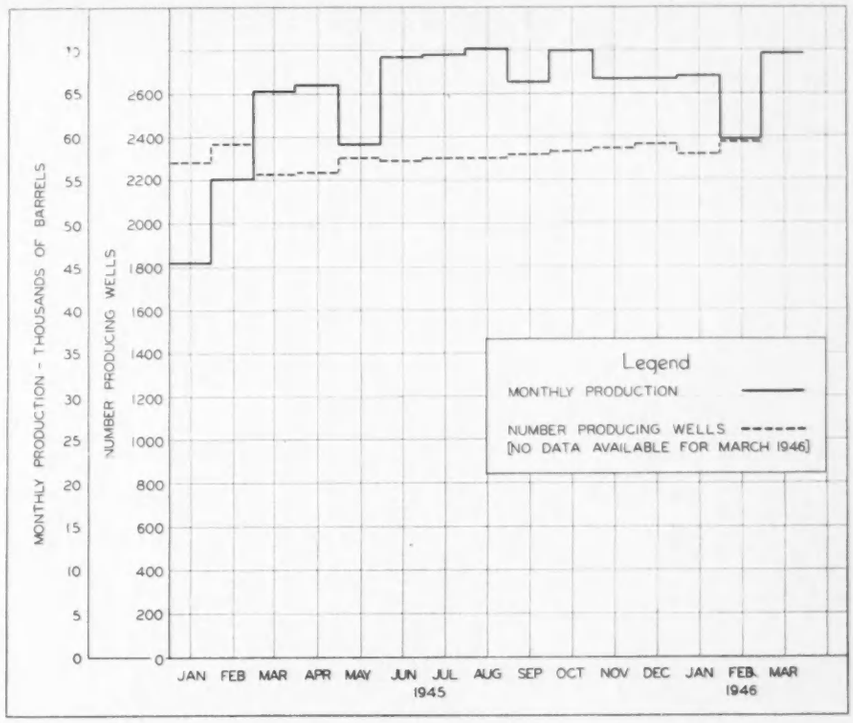

MONTHLY PRODUCTION - THOUSANDS OF BARRELS
NUMBER PRODUCING WELLS
Legend
MONTHLY PRODUCTION
NUMBER PRODUCING WELLS
[NO DATA AVAILABLE FOR MARCH 1946]
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR
1945
1946

Figure 2. Monthly production and number of producing wells in Poland.

A careful campaign has been laid out. The first step of this campaign was a psychological one. Its purpose was to counteract the easily understandable apathy and depression of the industry, which were brought about by the shock of losing more than free-fourths its production potential and of facing the prospect of complete shutdown of operations within the near future. An industry-wide conference was arranged. During this conference papers were presented by prominent Polish geologists, based on their prewar studies, pointing out the oil possibilities of the areas to which the industry is now limited. Different plans were offered, discussed and later agreed upon. These plans affect all the phases of operation of the industry.

The principal effect is directed toward finding new reserves. This effort will follow three general lines: (1) exploration of deeper horizons in the shallow fields now producing, (2) testing of known structures not explored so far, and situated in the general areas containing the present fields, and (3) testing of the areas which are not now producing and which were never tested by actual drilling.

Most of the records of the prewar geological and geophysical work have been destroyed or moved to Germany. Attempts are now being made to trace the location of these records and return them to Poland. The same is true of a number of geophysical instruments which were taken out of the country by the Germans.

Plans are made for extensive geophysical exploration. Without waiting for results of these explorations, however, several exploratory wells were begun on the strength of available data.

Planning, supervision and carrying out of this exploratory program has been placed under the Department of Exploration created for this purpose within the C. Z. P. P. P. The geological and geophysical phases of this program will

■ CONTINUED ON PAGE 36

TABLE 2
Polish Crude Oil Production Data

MONTH	Total Monthly Production Barrels*	Cumulative For The Year Barrels*
November, 1945...	66,772	703,577
December, 1945...	66,800	770,377
January, 1946.....	67,207	67,207
February, 1946....	59,799	127,006
March, 1946.....	69,678	196,684

* In converting metric tons to barrels factor of 7.4 barrels per metric ton was used.

TABLE 3
Polish Refinery and Natural Gasoline Plants Data

MONTH	Refinery Crude-Oil Throughput Barrels	Natural Gas Handled M.C.F.
November, 1945...	67,969	181,689
December, 1945...	68,879	180,418
January, 1946.....	70,515	185,748
February, 1946....	60,946	168,381

TABLE 4
Data on Employment in the Polish Petroleum Industry*
(Including drilling, Production, refining and Misc.)

Classification	No. Employed
Engineers and Technicians	359
Clerical Force	526
Workers	8,480
Apprentices	260
Total	9,625

* As of February, 1946.

PARTIAL RECORD OF ITS EVERY-DAY ACCOMPLISHMENTS

- **RE-CEMENTING**
- **SQUEEZE CEMENTING**
- **CEMENTING BEHIND SECTIONS OF PIPE**
- **TESTING UPPER CASED FORMATIONS**
- **REDUCING GAS/OIL RATIOS**
- **CEMENTING BAD PIPE**
- **PLUGGING OFF BOTTOM FLUIDS**
- **CEMENTING OFF TO PERFORATE FOR PRODUCTION**
- **CEMENTING LOW PRESSURE ZONES**

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Drill pipe, 2-inch tubing, or cable tools readily drill up Magnesium Alloy Cement Retainers since all large parts are made of magnesium except the nitricastiron slips which are readily broken up. Magnesium Retainers have ample strength to withstand any pressure which can be imposed safely upon the casing or liner. Although Baker Magnesium Cement Retainers are satisfactory for *temporary* bridge plugs, they may be affected by well fluids, and the "Cast Iron" type is therefore recommended for *permanent* bridge plug installations.

A portrait of

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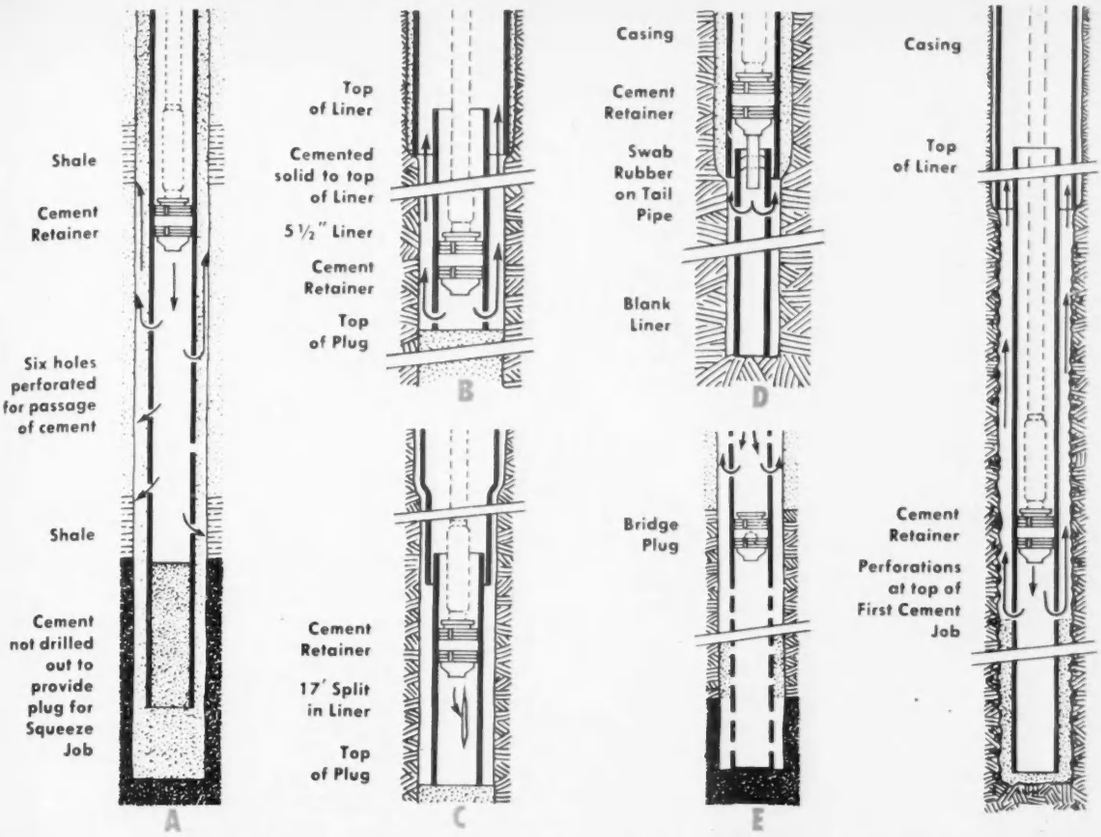

HERE ARE SOME DETAILS OF THE INTERESTING STORY OF MAGNESIUM CEMENT RETAINER SUCCESSES

A To control a gas/oil ratio of 25,300 to 1, with a production of 95 bbls. of oil, this well was cemented, and later cement was drilled out to a point just above the shoe. Casing was perforated with 6 holes above this plug; retainer was set; 43 sacks of cement put into formation at final pressure of 3,400 psi. Well was then completed, making 656 bbls. of 29° A.P.I. oil with gas/oil ratio of 466 to 1.

B To cement a liner (or casing)—the liner was run into this well on a Cement Retainer which was then used for placement of the cement around the liner from its bottom to where it extended into the water string.

C To cement off hole in casing or liner—where a lap-welded liner split and well went to water 100 per cent. The hole was bridged to a point just *below* split and Cement Retainer set just *above* split. After putting away 22 sacks of cement at 1,650 psi, water was completely eliminated.

D To cement through perforation in liner—and cement blank liner at its top. Cement Retainer was set in casing above liner and tail pipe (with swab rubber) extended into liner opposite perforation. Final pressure of 1,250 psi put away 75 sacks of cement—job completely successful.

E To provide bridge plug—retainer was set at top of blank section of liner which had been cemented below, but showed water at top. Thereafter this well was successfully cemented by conventional method through perforations above blank pipe.

F To complete an original cementing job where cement did not reach to top of blank liner (set opposite productive zone) to be gun-perforated. Perforations were made until top of cement was located; Cement Retainer was set above open perforations, and cement forced upward behind liner to a point above shoe of water string.

ARE THERE ANY QUESTIONS?
OR HAVE YOU ANY PROBLEMS?

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The American Oil Man And Foreign Oil

By E. DeGOLYER
DeGolyer and MacNaughton, Dallas, Texas

THE United States is by all odds the world's great consumer as well as the world's great producer of petroleum. It is likely to become increasingly important in the future as the great market for world petroleum.

Whether we like it or not—and I presume that most of us here present do like it—we of all people are definitely geared to an economy which calls for tremendous and increasing quantities of petroleum products.

We have produced in total and produce currently almost two-thirds of the world's oil. In producing this great quantity of oil we have drilled something more than 1 million wells and we drill currently many times more than all the wells drilled in all of the rest of the world.

In our oil field operations we have developed the tools, patterns and techniques by which the world's oil is produced. We have not necessarily been the inventors of these tools and techniques. The cable tool system and a primitive type of casing were old in China before our oil industry was born. The essential elements of the rotary are found in English and French drilling systems which antedate our own use of that method. We got geophysics from the Germans and Austrians. Electrical logging came from the French and we first learned of connate water from the Russians.

Tools Developed

It is in the development of these tools and methods—the reduction to practice and perfection of systems sometimes so crude and elementary that they were little more than suggestions, to their present degree of usefulness—that we have been supreme. This is but natural since the bulk of drilling which has been done in the world has been done in our country. We would have been stupid indeed if, with so much opportunity to try, we had not developed the standards and set the pattern.

Presented before the Spring meeting of the Southwestern District of the Division of Production of the American Petroleum Institute, at Shreveport, May 17, 1946.

It is not to consider the state of our production technology, however, that I appear before you. I have considered it briefly only in order to stress the point that is of equal or greater importance. In developing our oil fields we have developed also a great group of oil field workers—men skilled and experienced technically and scientifically in oil field operations—a great group of oil men. We have built not only a group of men trained and skilled in oil field operation and management but we have also created great aggregates of venture-minded capital—capital managed by executives with experience, understanding and acceptance of the hazards inherent in oil field operations.

Nor did I come here to discuss our nation's oil reserves. When we look to the future it is the undiscovered reserves which are important and, fortunately or unfortunately, they are not subject to measurement. To date we have discovered in this country something more than 50 billion barrels of oil of which we have produced something more than 30 billion barrels, leaving some 20 billion barrels of proved reserves still to be produced. The boldest speculations I have yet seen estimate the oil remaining to be found as of the order of magnitude of another 50 billion barrels.

Many noteworthy differences exist between operations in the U. S. and the pattern abroad

My view on this matter is that one speculation is about as good as another. It may be that there are not 50 billion barrels yet to be found. It may be that three times 50 billion barrels remain to be found. I do not know. One must be a bold man to hazard an estimate in an industry where a poor, half-bankrupt wildcatter, during a year in which the rest of the industry spent a minimum of 25 to 30 million dollars in searching for oil with almost negligible results, could finally worry down the discovery well for a pool, the total reserves of which represents 10 percent of all the oil yet found in our country.

Whether our reserves still to be discovered are great or little—and all of us without question hope that they are great—there is another equally important question and that is, at what rate can we expect to discover these reserves? On this point I have more definite opinions.

It is only within the past 10 to 15 years that as an industry we have become discovery-conscious; that we have even attempted to measure or estimate the amount of new oil that we find each year. As yet, our estimates are not too good. Obviously, if a new pool is discovered by the successful completion of a wildcat well, it is always difficult and in most cases impossible to estimate the amount of oil discovered until further drilling has outlined the probable extent of the pool. Consequently, our estimate of discovery in a single year is not much good until three or four years of development have better revealed what was actually discovered. But there are difficulties beyond this.

The mammoth East Texas pool was well outlined within six months of its discovery. It is a comparatively simple, essentially one-sand field but it took almost 10 years for us to come to an

even reasonably accurate estimate of what its ultimate production might be.

We have made some progress in our studies of discovery, however, and from them it is my opinion that we can get an over-all view of the history of oil exploration in our country and from it some basis for estimating the future.

Using the best statistics at present available to us, those released by the Production Division of the Petroleum Administration for War in its report on "Crude Oil Production and Reserves in the United States, March 13, 1945," one finds that throughout the entire history of the oil industry to and including the year 1925, there were only three years in which as much as 1 billion barrels were discovered. In the five-year period, 1925-1929, notwithstanding the fact that 1925 was one of the years of lowest discovery, a total of some 7.6 billion barrels or an average of over 1.5 billion barrels annually were discovered. In the five-year period, 1930-1934, a total of some 10 billion barrels or an average of 2 billion barrels annually were discovered. In the five-year period, 1935-1939, a total of almost 9 billion barrels or an average of over 1.75 billion barrels annually were discovered. The five-year period, 1940-1944, is too recent for the estimates to be trustworthy but we appear to have discovered an average of less than a billion barrels annually.

I will not labor the point. Most of you have your own ideas of whether or not it is becoming more difficult to find new oil.

Availability Concept

There is another concept so new that it was first studied seriously only during the war—that of availability. How much oil can be produced daily without damaging our reserves or, to borrow a term from California, the mer—maximum efficient rate. It is worth noting at this point that as a result of the high plateau of discovery from 1926 to 1940 we got conservation, which was a great step forward, and the industry went into the war with a developed mer capacity to produce of more than 1 million barrels daily in excess of the then current production requirements. Discoveries translate into reserves and reserves into ability to produce; into mer. If we are ever called upon to repeat the sterling performance of the industry in the past war we may as well realize now that it can only be done if we have the period of excess discovery building up into substantial excess mer which was the essential preliminary to the superb performance which we have just concluded.

All the foregoing discussion—entirely too long—is preliminary to my main thesis: The oil industry has been a rapidly expanding one. It now appears that the domestic industry, on the old pattern at least, is in a period of lessening opportunity. There is opporunity abroad. You are trained and prepared to take it. It is in the national interest that you do so.

American companies are substantial and successful operators in foreign fields. According to a recent statement by Senator O'Mahoney, "Fifteen United States oil groups now own or have a share in the ownership of crude oil reserves in 20 foreign countries." Except for a handful of independents who hang on in Mexico and an occasional independent in Venezuela, Colombia and Peru, foreign operations by Americans are strictly big-company operations. This is understandable. Foreign operations are generally slow and expensive. They involve difficulties beyond those common to domestic operations. Even markets, so simple at home as to present no substantial problem, may, in case of successful foreign operations, involve the construction of pipe lines and even refineries. Supplies (even food), equipment, workmen, management—most of these may have to be imported. There is no escaping the fact that foreign operations, as I have previously said, are slow, expensive and require greater amounts of capital than are necessary for domestic operations.

On the other hand, independents and small companies in numbers were successful operators in Mexico and are successful elsewhere in fewer numbers. There is at present a tendency for increasing numbers of smaller companies to operate in foreign areas and there is no reason why individuals or smaller companies, individually or in groups, should not engage in foreign operations. The purpose of this paper is to point out some of the differences which exist between the pattern of oil field operation in foreign areas and those in the United States, in the hope that such a presentation may be of service to individuals or small companies of this country.

Political Factors

In introducing a sketch of some of the differences—and differences to most of us are too often difficulties—I should warn you and urge you to study political conditions and the people of the country which you propose to enter. You must weigh the political risk. Consider the stability of government, economic conditions, legal concepts and reckon with increasing tendencies toward nationalization. Consider alliances, foreign alignments and outside pressures. Most of all, consider the people of the country. If you do not like them and if you cannot get along under their institutions as they exist, you had better stay out of the country.

Ownership of the subsurface or mineral rights by the owner of the surface, as it is known to us, is a condition which exists in so few areas outside the United States as to be almost negligible. It did exist in Mexico during the period of that nation's greatest oil development and under it, Americans operated in greater numbers than they have ever operated in any other foreign area. Even here, however, the historical tradition of the Mexican people was entirely against such form of tenure. It was changed by the Constitution of 1917 and after a long and weary struggle the net, though not the direct, result was expropriation.

Leasing Procedures

In most foreign areas the subsoil pertains in some form or other to the state. The taking of leases—concessions, they are generally called—under such conditions is generally by either of two distinct procedures, both as to time and place.

In some areas the nation either has no mining law adequate to govern petroleum grants or has no adequate petroleum law, in which case any grant of oil rights has to be negotiated with the heads of government and ratified by its legislative bodies. Such procedure is in effect a tailormade job and is given validity by such legislative procedure as is required for any law. Under such conditions there is almost no limit to the type of concession which may be framed, but even here the operator will be well advised to keep his concession as equitable as possible and not to stray too far from the patterns set by experience elsewhere. A variant of this type of tenure is where there is existing law which sets some limit to the type of concession which may be granted or where the general terms are rigidly defined by law and there are only one or two variables such as bonus or amount of royalty. Such loose conditions as have been described are generally an evidence of political immaturity of the state subject to them and the net result is generally blanket concessions of tremendous size; concessions which are monopolistic in character and which grant areas greater than necessary for the proposed operation.

Code Law

The other and far more rational type of procedure is that of nations, far too few in number, with adequate mining or petroleum laws which provide for grants of adequate size through some fixed and limited type of procedure.

It should be emphasized at this point that in many countries, and almost entirely in Latin-American countries, you will be living under code law and that equity and common law, such as you are accustomed to, does not exist.

It cannot be emphasized too strongly

that an American going into a foreign country goes in on a parity with the nationals of that country; that his redress for any injustice which he may suffer is through the courts of the country. One eminent authority states it even more strongly:

"In general, a person who voluntarily enters the territory of a state not his own must accept the institutions of that state as he finds them. He is not even entitled to demand equality of treatment in all respects with the citizen of the state.

"On the other hand, if a state has a low standard of justice toward its own nationals, an alien's position is in a sense a privileged one, for the standard of treatment to which international law entitles him is an objective one, and he need not, even though nationals must, submit to unjust treatment."

All of this is by way of indicating that the times when one is entitled to ask for diplomatic protection are likely to be few indeed. Your consuls and diplomatic agents are much more likely to be of service to you in giving friendly and wise counsel out of their background of extended experience and knowledge than in protecting you in what you may erroneously believe to be your rights. The American who attempts to project into a foreign country the social and economic and sometimes even the legal pattern to which he has been accustomed had better stay home.

Operations

Generally speaking, operations in foreign lands may be and often are subject to difficulties of which the average independent operating only in the United States finds it hard to even conceive. This is more nearly true for exploratory operations than it is for development operations, once a field has been found. Geologic work may have to be done on foot or horseback. The road to a drilling location may cost more than the well. Operations, especially of an exploratory nature, are subject to long delays. Replacement material for broken parts may have to be ordered from overseas. I knew of one 5000-foot well drilled in India for which two complete drilling outfits were supplied in order that one outfit might be cannibalized for parts and delay in operations avoided.

Personnel

Any initial operation by Americans in a foreign field is likely to be of an exploratory nature. It is natural that such ventures should be handled by Americans, but it is highly desirable, in case of success and long-continuing operations, that nationals of the country in which the operation is conducted be trained to replace Americans in every possible job, including the higher administrative posts, for which capable men can be found.

This is no hard and fast rule but it is worth noting that in Mexico, one of the chief complaints of the Mexicans, and it appears to be a just one, was that the Mexicans themselves were shut out from the higher technical and administrative posts. It is notable also that for one of the principal American operations in Venezuela, all the drillers are Venezuelans as well as the chief geologist and chief petroleum engineer and perhaps other important posts not known to me are likewise filled by Venezuelans.

Finance

I hope that I am not making the problems of foreign operations appear too difficult. I do not intend to do so and they are not really too difficult. They are chiefly just different.

There are two points with regard to finance that you should consider—difficulties, if you please. One is that foreign oil is not generally regarded so favorably as bank collateral as is domestic production. Consequently, you are likely to find your development funds either through company organization or through partnerships, in case you discover oil.

The second is that through money-export restrictions, you may have difficulty in moving money back into this country.

I could continue this primer for foreign operations indefinitely. It has already become too long. In closing, however, I want to stress two intangibles.

Operations in a foreign field, aside from presenting you with a wider economic opportunity, are important to your nation and to the nationals of the country in which you operate. There is no time to develop the importance of foreign operations to your nation, but it is a factor which you must not forget.

Of even greater importance is the fact that, if they are to prosper, your operations must be of definite and tangible benefit to the people of the nation in which you operate. I do not mean by this, to the people collectively—such as attained, for example, by the payment of royalty to their government. I mean, to as many of the people individually as your operations may be able to benefit. I know of one company operating in a foreign field which budgets and spends a definite and substantial sum per barrel of oil produced to improve the economy of the people amongst whom it works. It goes in for projects as far afield from the normal scope of its enterprise as agricultural improvements—irrigation schemes improvement of animal breeding, etc. Does this sound altruistic to you? The hardheaded men who run the enterprise think that it makes sense.

Poland's Oil

■ CONTINUED FROM PAGE 29

be carried out in cooperation with the State Geological Institute. Much of the preliminary work has been already done during 1945 by the Polish Petroleum Institute.

Efficiency

Table 4 shows the number of men employed by the Polish oil industry during February, 1946, and the breakdown of the total number into different categories. With total employment of 9625 men, only 59,775 barrels of oil were produced during this month. About the same number of barrels were refined. This extremely low per-man output is fully realized by the industry and steps are planned to correct this situation.

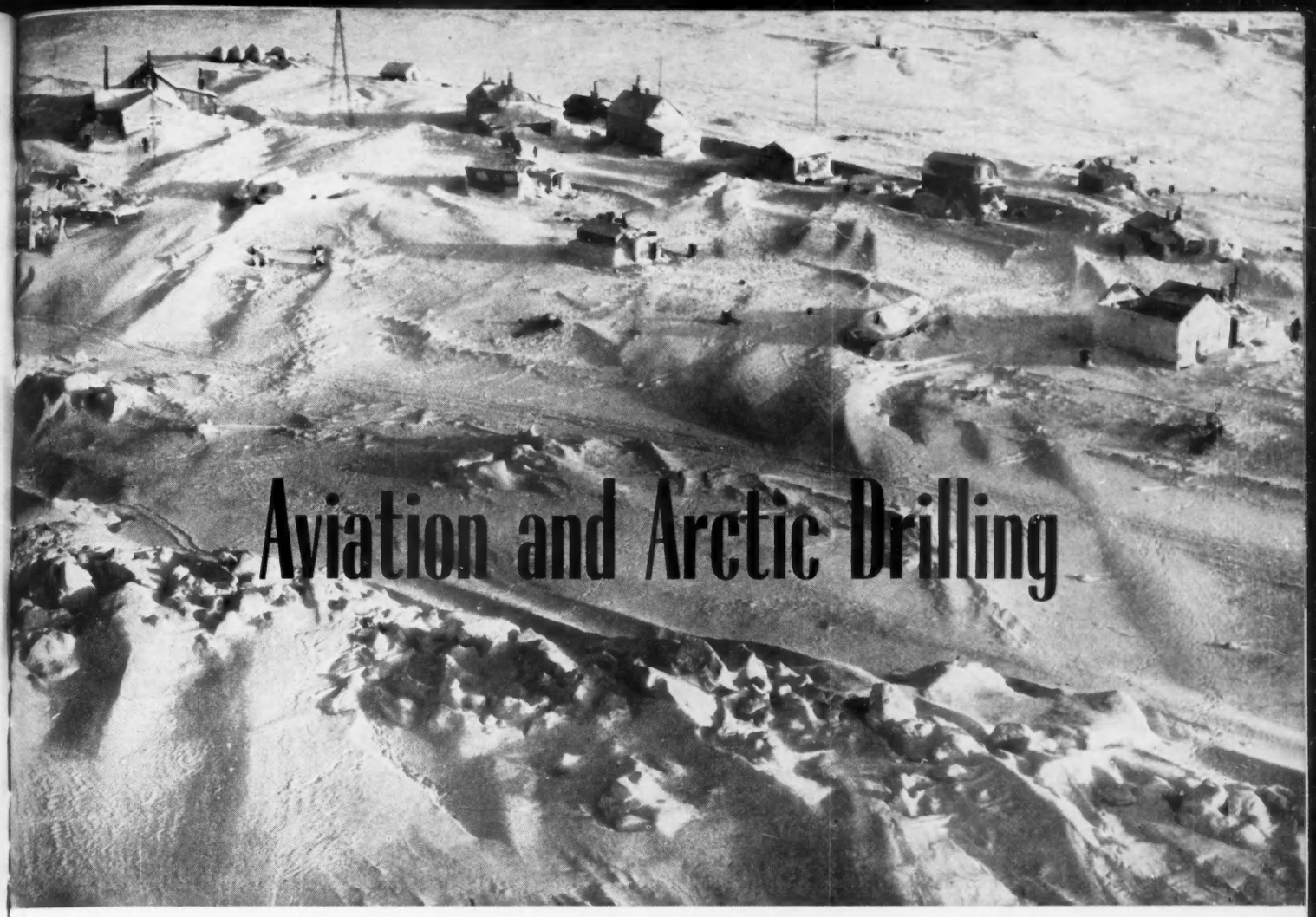
Another effort toward improvement of efficiency is centered around the slow drilling progress, already commented upon. Since the principal cause of this slow progress is continuous shutdowns due to lack of equipment, plans are made for curtailing of drilling in the proven fields and concentrating on fewer, better equipped rigs. Long-range plans include restoration to full production of the Drilling Tools and Machinery Manufacturing Plant at Glinik Mariompolski.

Most of the records on the prewar standardization work have been lost or destroyed. The Polish Standardization Commission carries its work through two committees, the Committee on Liquid Fuels, working out standardization of the refining branch of the industry, and the Committee on Well Equipment and Drilling Tools. The latter works through four sub-committees on drilling, production, natural gasoline and machineshop practices.

Vocational Training

An extensive program of vocational training has been inaugurated under the auspices of the Polish Petroleum Institute. A two-year course is offered to apprentices who, alternately, work one week in the field and attend school another week, while receiving their full monthly pay. The school week consists of 46 hours. In addition to these schools, of which there are two, short courses are offered to workers, covering different phases of oil field occupational work. Courses in foreign languages are also available. The teaching staffs consist of engineers, technicians and foremen who volunteer their time for a small nominal fee. The whole program is working under severe handicaps of food and housing shortages and of transportation difficulties.

The program of rehabilitation and of expansion which the Polish oil industry mapped out for itself is ambitious and, under existing circumstances, certainly a difficult one.



Aviation and Arctic Drilling

Aerial view of Point Barrow, two miles from Barrow, the Seabee base for operations on Navy Petroleum Reserve No. 4

A NEW chapter in the history of air transportation has been made on Navy Petroleum Reserve No. 4, in Alaska. The Arctic has been penetrated as never before, from the skies; and the age-old barriers of cold, snow, ice and muskeg have been overcome so that with the airplane, the remotest stretches of that desolate country are now within man's reach. Moving men and material by air is as much a part of the Navy's exploration venture on the Reserve as the actual drilling of Umiat 1. Without the use of planes, the project could never have reached its present stage, and it is doubtful whether it could ever have gotten under way. From the time the two original equipment and supply-laden ships of the expedition entered the treacherous, ice-filled Bering Sea, in July, 1944, with PBY's flying overhead scouting the floes, until the crew was flown from the well site early in October of 1945, after the freeze-up, the airplane has been a major transportation medium for much of the activity on the Reserve, rivaling the Weasel, dog sled and cat train. Even now, were it not for the weekly flights from Fairbanks to Camp Barrow, the Seabee contingent there would face a winter of bleak isolation, with radio as their only means of communication with the outside world. As it is the planes bring weekly mail service and supplies, and provide transportation out for the men with sufficient points for discharge.

Pioneer Venture

Much of the flying has been of a pioneer nature, for at the beginning of the project there were few navigation aids. The planes had to make their trips by contact, which was often exceedingly difficult. Schedule flights were impossible because at times there is no contact in the Arctic. In the winter when snowstorms sweep down from the frozen ocean nothing can be seen, and in the summer there are frequent fog blankets almost as black as night. Also, the very short days during the winter cut down the time, greatly limiting the possibility of contact flights, especially long ones. On the Arctic plain also, contact is unlike other places where there are well-defined landmarks. With nothink' but ice and snow visible as far as the eye can see, it is very easy to misjudge and get off the course, and that misfortune when it happens in the Northland can mean disaster very quickly. It took a world of courage to fly the Arctic, blind, so to speak, plus the best of judgment and the utmost in foresight. The pilots who have shared in this great exploit deserve the credit that is due the world's bravest men.

"Alaskan Knights", or bush pilots, have led the way over barriers of cold and snow at the top of the world

The advanced stage of aviation in the far north of Alaska is largely a result of activities of the Naval Air Transport Service. This organization made a brilliant record in many parts of the world during the recent war.

NATS made its first flight into the little-known North Country on June 22, 1942, when a Sikorsky seaplane flew non-stop at night from Seattle, Washington, to Kodiak, Alaska, a distance of 1450 miles, directly across the Gulf of Alaska. The plane was piloted by Lieut.

"Eskimo Joe" and his dog team race alongside the runway at the Naval Air Transport (NATS) terminal, Point Barrow, Alaska, as a NATS plane comes in for a landing on the snow-packed runway. Official U. S. Navy photo

Comdr. John R. MacKroth. Included in his crew was a celestial navigator, but there were no facilities to help him, no radio bearing, no landmarks—nothing except a sky full of bad weather and an ocean of icy water. The round trip was made without mishap, however, and with little evidence of its historical significance.

Perilous Flight

Four days later, June 26, 1942, a regularly scheduled flight was inaugurated, when three R4D-1 planes headed in "loose" formation for Kodiak, with Lieut. Comdr. Jerome H. Sparboe, now deceased, as the lead pilot. This flight, however, was not as uneventful as the first. The formation flew up the coast, landed at Annette and then at Yakatat before turning out over the Gulf of Alaska, west, in foul weather for Kodiak. The radioman in the lead plane tried to contact Kodiak, after the Yakatat take-off, for weather and landing instructions, but could never get Kodiak. He did reach Dutch Harbor with his set, but information about the weather there was of little help in trying to land at Kodiak. The predicament of the planes can easily be imagined. In weather growing steadily worse, flying on instruments, they were heading toward a field they had never seen, without benefit of radio range, and apparently with no immediate prospect of establishing contact to request the range. The command pilots, after an inter-plane conference, chose their only alternative, a dash for Cordova, their best bet for making a successful landing. The bet was good and the landing was made safely, at night, in a driving rain on a poorly-lighted, half-completed field, a typical accomplishment in those early days in Alaska. After two hours the communication difficulties had been overcome and the planes took off for Kodiak, landing there after 12.9 hours of flying from Seattle, and scheduled flying into Alaska had begun.

Expansion of the schedule into the heart of Alaska began in 1944 when Air Transport Squadron Five, VR-5, commanded from Seattle, shifted its main detachment from Kodiak to Anchorage, and a shuttle service was extended north to Fairbanks. This was the cold weather country, offering problems in weather different from those encountered in the williwaws and the fog and ice of the Aleutians.

Winds which poured over the snow-covered mountains from central Alaska were just as fierce, however. Some of the pilots who had managed to dodge the williwaws out the chain ran into a new kind of fury in the skies over Anchorage and Fairbanks. Even the big Skymasters, when caught in a storm, would churn up and down like a leaf in the wind. Pilots worried most whether the huge wings might not pop off under the strain. Icing conditions added to the peril, but somehow the big transports always came through.

In January, 1945, VR-5 began work in support of the Navy's petroleum project on Reserve 4. Commander H. C. Hollenbeck, then skipper of VR-5, now a commanding officer in the Pacific, made the first flight from Fairbanks to Point Barrow on January 20. NATS men knew little about operations in weather that was consistently 30 degrees below zero, but they learned fast. During February, three flights a day from Fairbanks to Barrow, 517 long miles, became routine, and by late March the big planes were landing at Umiat, the Seabee camp near the site of Umiat 1, 175 miles southeast of Barrow.

With the flights to Umiat, big-time operations on the Arctic slope got under way. The spring thaw was close at hand. At Umiat there was still plenty of thick ice mixed with gravel to land on, but that was all. The churning cat trains of supplies which the Seabees had snaked from Barrow to Umiat could no longer move, once the "break-up" had begun. There was still much to be done before Umiat 1 could be spudded, to get all the material and supplies on the site and at the camp. NATS had to help finish the job and do it in a hurry. The record speaks for itself. The now-or-never job was done in tip-top shape under the most adverse conditions and in Alaska's coldest weather.

Camp Barrow (foreground) and Point Barrow village (background).

Giant Task

During the two months of April and May, 1945, more than 2 million pounds of cargo was flown to Umiat. Night and day it became a task of loading and unloading heavy pipe, tubing, oil drums, drillers' mud, cement, rig houses, weasels, tractors, food supplies and other equipment. By mid-May, when the thaw

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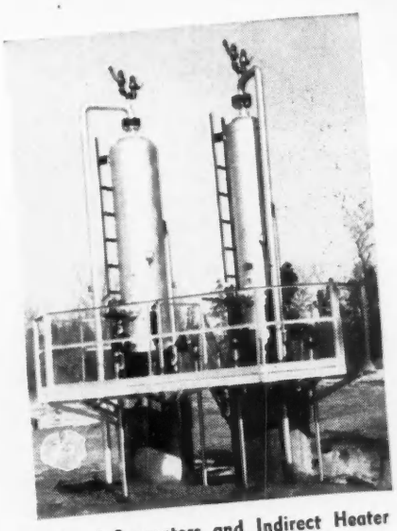

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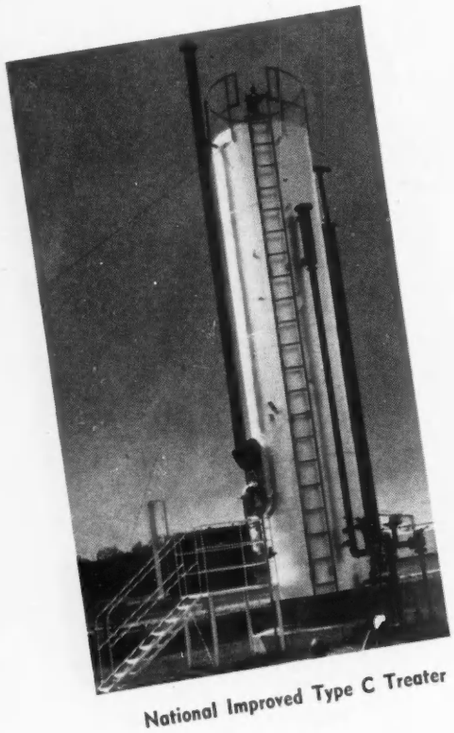

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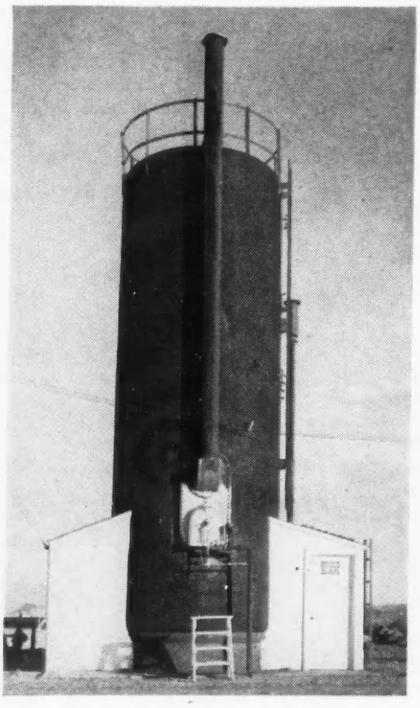

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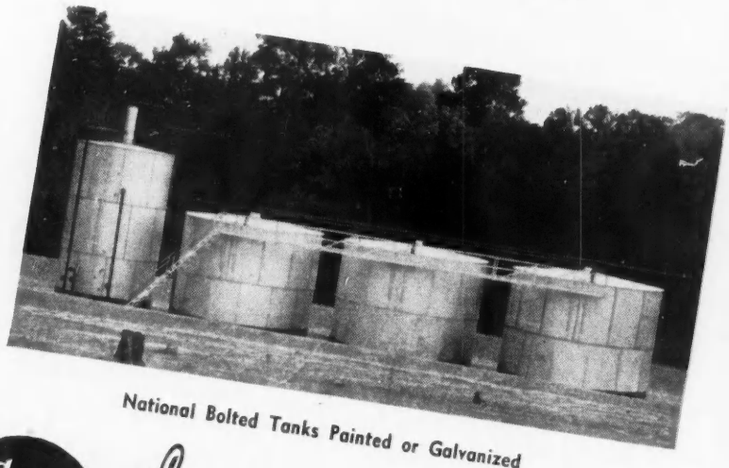

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cut loose in earnest, most of the cargo had been moved and the well was spudded well ahead of the scheduled time. Officials estimated that air transport had hastened the petroleum exploration by several months.

Random statistics from a notebook of one of the pilots bring the record down to facts:

The first landing at Barrow was on January 20, 1945.

From February 20 to November 1, 1,697,000 pounds of cargo and passengers and mail were flown from Fairbanks to Barrow. During May, 114 trips were made to Barrow, and two 4RD-6 Skytrains were worn out.

Planes in and out of Barrow and to Umiat, during April, hauled 1,149,147 pounds. April 1-15, 831 drums of fuel amounting to 45,705 gallons, in 50-gallon drums; April 15 to May 1, 544 additional drums, amounting to 29,920 gallons.

From Barrow to Umiat, 1375 drums of fuel. During April, 259 flights in and out of Barrow, with 149 trips from Barrow to Umiat. No accidents during the entire time, and only three engine failures.

From April 17-23, 5642 feet of drill pipe was flown from Barrow to Umiat, in 31-foot joints. The pipe had to be wedged through the companionway, up to the pilot's seat. Magnetic attraction of the pipe threw the compass off and the flights had to be made by contact.

Several weasels weighing 5240 pounds each were flown to Umiat. A generator weighing 5200 pounds was included, also a jeep weighing 3195 pounds.

A tractor roller frame weighing 4260 pounds was among the items flown to Umiat. Also 99 cases of dynamite, total weight 5940 pounds, with 15 boxes of caps weighing 900 pounds.

Two sleds and ten dogs were moved by plane. Also a stove weighing 1002 pounds, and about 150 pounds of fresh milk daily.

The average turn-around time at Umiat was 11 minutes. At Camp Barrow, the R5D's averaged 25 minutes in loading and unloading.

The average temperature at Umiat, in January was 45 degrees below zero, in February, 42 degrees below, in March, 41 degrees below, and in April, 19 degrees below.

During October, 385 persons were flown from Point Barrow to Fairbanks.

A propeller unit in one piece, weighing 3642 pounds, for one of the ships that docked at Camp Barrow last summer, was flown from Fairbanks to Barrow.

In addition to these heavy pieces of equipment, there was a constant flow of innumerable small items such as tools, drill collars, etc., to the well at Umiat, by plane.

Unloading a Weasel from an R5D, "Klunk" at Umiat.

With the well shut down for the winter, flights to Umiat have been reduced to those necessary in connection with the weather station, and occasional inspection of the well.

Hazards Reduced

It is a long stretch from the time of the pioneer flying into the Far North without navigational aids or any aerial communications, to the present. Then the first crews lived in their planes, since no buildings had been constructed in the barren country. Even with the use of tents pitched on the snow, the flight crews found little comfort from the cold. Now they have comfortable quarters at the bases. They fly with the aids of radio range stations spotted throughout Alaska, and ground controlled approach systems at many of the fields, which permit landings in spite of closed-in weather conditions.

With all these improvements, however, conditions are still hazardous on the Arctic slope. There is only one radio range station between Fairbanks and Point Barrow, at Umiat. The flight crosses the formidable Brooks and Endicott mountains, high and rugged almost beyond imagination. When contact flying is possible the trip can be made by going through the passes at a comparatively low elevation, but when the weather is closed in, the planes have to take out over the top of these peaks, which means flying at about 13,000 feet.

"One thing the pilot has to remember in the Arctic," a veteran flyer said, "is that the ice loads can't be removed by going to lower altitudes, especially when flying over the mountains. It just can't be done. Flying the Aleutians and Alaska is tough, worse than the 'Hump,' and I know, for I've flown both."

This fragmentary glimpse of aviation in the Arctic must take notice of the bush pilots, "Alaskan Knights," they are sometimes called, for they are the real pioneers of flying in Alaska. The Army and Navy have supplied all the scientific aids and devices that cut down the risk and danger in aerial transportation, but much of the experience needed to make the best use of these modern developments in Alaska has been found in the men who had flown there without the help of such aids. They flew by contact and instinct, usually in small, single-engine aircraft. Sometimes they took off from and landed on strips, of a sort, but more often they took off from wherever they happened to be and landed, if they were lucky, on the water or ice. Their planes were equipped with floats or skids, and sometimes they didn't get back. These men were responsible for a high degree of aviation development in Alaska, however, a good many years ago. Air transportation had come of age in that country long before the war, with a much higher percentage of the population being air-minded than in the United States.

A "bush pilot," as defined by one of their number, is a man who ran a small, independent air line, supported primarily by the mining and trapping industries. He had to be endowed with unusual ingenuity and fortitude to survive in this adventurous occupation, and some of those who did survive are now the nucleus around which the Navy's successful air operations in Alaska have been built. Those within the age limits went into the military services, and the Navy has used them wisely. The ones with experience in the North were assigned to the petroleum project on Reserve 4, and have stayed with it, and to them is due much of the credit for the record of achievement and safety.

Rising Living Costs In Latin America

Inflation grasps Brazil, troubles Mexico, and there is talk of zooming prices in Argentina

One of the highest paid industrial employes in Mexico is the oil field worker.

THE rising curve of monetary circulation and its natural companion, the parallel increase in the cost of living, is being felt strongly in Latin-American countries.

Current reports indicate that Brazil—especially in Rio de Janeiro—is in the grasp of inflation. The average citizen pays 50 percent more to live in Rio de Janeiro than in Washington, D. C. There are many shortages in Brazil with products imported from the United States selling from 400 to 500 percent higher. The principle of slow turnover and high profit on individual items is subscribed by more dealers in Rio.

In Argentina there is talk of the zooming cost of living. In fact, economically speaking Argentina is just learning there's been a war. Food is plentiful but prices are rising. The increasing cost of living now makes headlines in Buenos Aires newspapers.

There are no shortages in Argentina except automobiles and a few imported articles.

High Prices, Low Pay

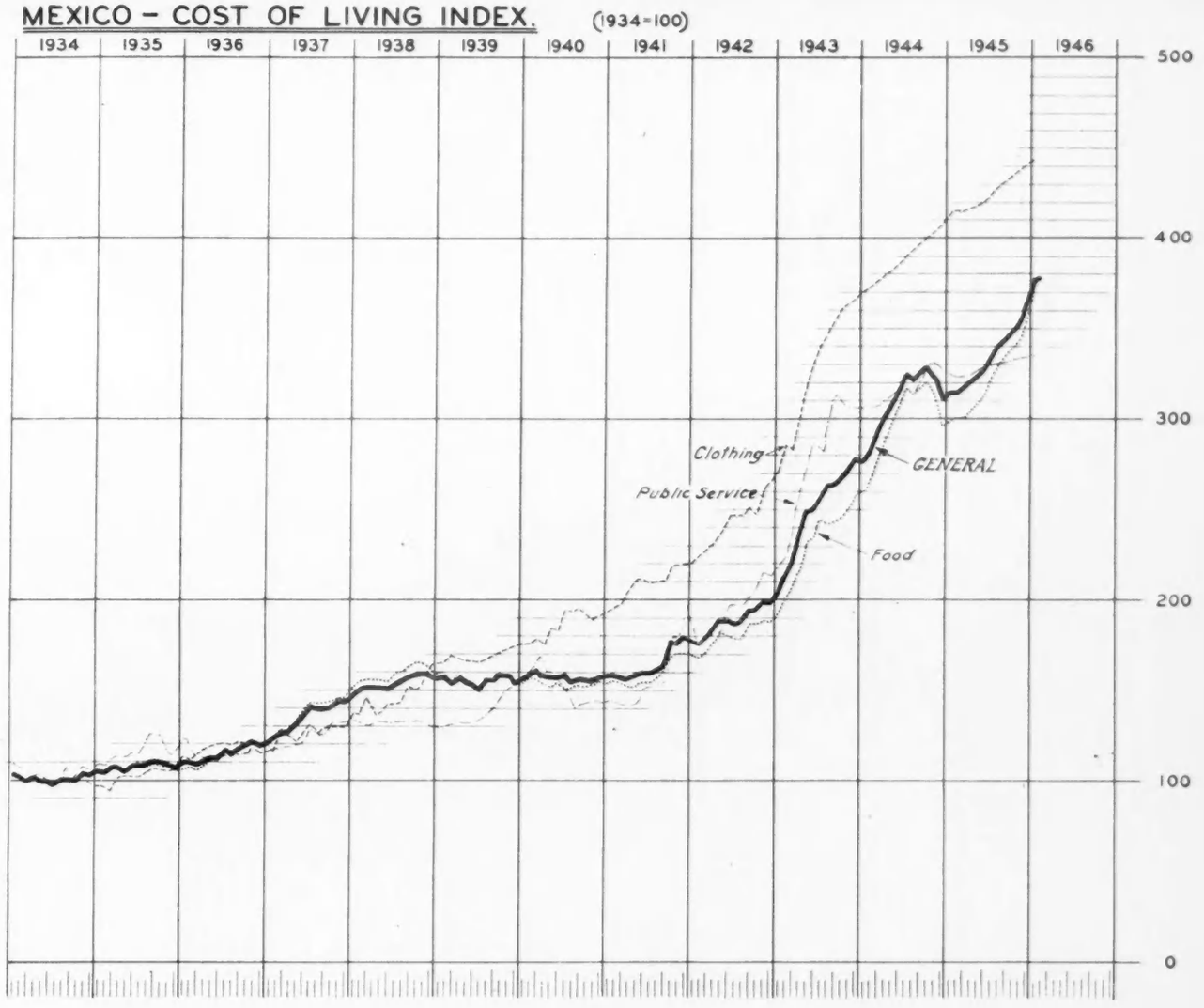
However, reports say that even with higher prices, they do not yet compare with prices in the United States. Still prices mean little unless the individual income is considered. The income in Argentina is very low, with the minimum salary considered necessary for a family of three, on the basis of government studies, being $38 a month.

Mexico also is having trouble with rising cost of living, which is being protested by united labor organizations.

The items listed in Table 1 may serve to bring Mexico's general picture into better focus:

Items listed in the table are all absolutely necessities for the common working man and the general average increase of 444 percent gives some measure of his difficulties under this inflationary trend.

The petroleum industry in Mexico has been particularly hard hit by inflation. The ordinary business man, caught in the rising spiral, swims with the tide, raising the wages of his employes again and again as living costs mount—and



passing his increased costs on to the consumer by raising his selling price. But the petroleum industry lacks this last recourse. Prices of petroleum products in Mexico have remained practically unchanged all through this inflationary period and any attempt to raise them anywhere near in proportion to the general price increase would be unthinkable.

Petroles Mexicanos (Pemex), a government dependency, controls practically the entire petroleum industry in Mexico. With the exception of a small group of "confidential" employes, almost every man in the industry belongs to the Petroleum Workers Syndicate. The pressure that can be brought to bear on the administrative officials of Pemex by a union with this vital industry in its hands is easily conceived.

Wage Hikes

Wages and benefits to the working men have been greatly increased. The general manager's last statement gave the figures of an increase from 45 million pesos (about $9 million) in 1937 to 179 million pesos (about $36,800,000) in 1945 for these items. However, personnel has also increased due to the fact that the volume of domestic consumption has been increased by 50 percent during the same years. But even such an excellent increase in volume cannot result in any increase in net income when offset by increases in wages, costs of materials, and all other expenses.

Wages in the petroleum industry have been, for years, the highest paid any industrial workers in Mexico.

New salary adjustments are now being requested by the Syndicate, and more will follow until the inflationary trend ceases. Pemex lends a sympathetic ear but the problem of how to get the money remains acute.

TABLE 1

ITEM	Quantity	PRICES 1934	PRICES April, 1946	Percent Increase
Sugar	1 Kilo (2.2 lbs.)	$ 0.29	$0.85	193
Rice	1 Kilo (2.2 lbs.)	.17	.85	400
Beans	1 Kilo (2.2 lbs.)	.10	.86	760
Lard	1 Kilo (2.2 lbs.)	.80	4.50	462
Corn	1 Klio (2.2 lbs.)	.08	.42	425
Wheat Flour	1 Klio (2.2 lbs.)	.28	.73	161
Tomatoes	1 Klio (2.2 lbs.)	.17	1.05	518
Cotton Cloth	1 Meter (3.2 Ft.)	.24	1.50	525
Overalls	1 Pair	2.11	13.70	550

The above tabulation was printed in "Excelsior" in Mexico City, May 10, 1946, from a united labor organizations protest against the high cost of living.

Large Gas Field Reported Discovered in Caucasus

A large natural gas field has been discovered recently near Stravropol in the Caucasus region of the Soviet Union, according to the Moscow radio.

Meantime, plans are complete for the construction of a 325-mile natural gas pipe line between Dashara and Kiev in the Western Ukraine.

Details of Colombia Royalty Oil Purchase by Feldman Are Reported

Belief is held in New York, where the D. D. Feldman plan to purchase royalty oil from Colombia is being watched closely, that since the new administration of President Ospina-Perez takes over on August 7, the deal will go over for that government to handle.

Bogota newspapers *El Tiempo* and *Capital* indicate that the deal has been approved by Petroleum Minister Camacho but still must pass the council of state.

Feldman's Dallas office had no announcement last week about this or his offer to buy Venezuela royalty crude. The latter deal, it is believed, is still unapproved.

Six-Year Amortization

The Feldman plan in Colombia, it is reliably reported, calls for formation of a company to be known as Petroleos Nacionales de Colombia with a capital stock of 10 million pesos (about $5,700,000) for the purpose of buying and refining royalty oil in Colombia.

Under terms of the proposal, these reports say, Feldman will put up all of the capital with some shares being sold to the public. This investment is to be amortized over a six-year period, after which the profits are to be split 50 percent with the government. The government would exercise full control even though it does not put up any capital except supplying the royalty oil.

The project of the company is to be comprised of three refineries, located at Puerto Berrio, Buenaventura and Bogota. There is also to be constructed a 185-mile pipe line to supply crude to the Bogota refinery, which is to have a capacity of 5000 barrels daily. Construction of 185 service stations throughout the country also is proposed.

As this is to be a Colombian-owned industry, the plans call for the training of Colombian personnel in order that the entire project might be administered by nationals.

Feldman also is reported negotiating for the purchase of approximately 33⅓ percent of the royalty oil of the Venezuela government between December 1, 1946, and November 30, 1948. This oil would amount to about 20 million barrels annually and would be shipped to the U. S. for refining.

The proposed contract between Feldman and the Venezuelan government is reported to contain, among others, the following stipulations:

Feldman would pay the going price for the royalty oil and hand over to the government 50 percent of the profits which he may obtain through the resale of the oil whether effected within the country or abroad.

Profits are understood to be those resulting from deducting from the price obtained through the resale of the oil, the price which may have been paid to the government, plus the expenses for the administration of the enterprise, transportation, total Venezuela taxes paid and other expenses incurred.

If any part of the oil acquired by the contractor shall be sold to any refinery in the U. S. in which Feldman may be economically interested, even though indirectly, Feldman shall be obligated to guarantee to the government a minimum profit of 5 cents per barrel thus sold. Twenty-five percent of the total crude sold by the contract to such refineries shall be entitled to a discount equivalent to the import tax payable on Venezuelan crude oil in the U. S.

The contractor shall determine the amounts and quality of oil which the government must deliver to him in fulfillment of the contract. He shall also determine the Venezuelan ports at which the deliveries must be made and the dates of such deliveries.

May Be Purchasing Agent

The contractor shall make a study of the economic factors relating to the contract during the period comprised between the "present date" and August 1, 1946. To this end, the government is obligated to give the contractor, beginning June 10, 1946, all the facilities and data available to it regarding the oils which it can sell to the contractor under the contract, regarding conditions in the ports to which oils might be sent, and regarding any other facts which may be of interest to the contractor in connection with the present negotiation.

If the government so requires, the contractor will act as purchasing agent for equipment and material abroad being paid for this material in royalty oil. In the resale of the royalty oil under this clause, the government will receive only 30 percent share of the profits.

In the proposed agreement, the contractor is reported to have reserved the right to desist from the contract prior to August 1, 1946, by giving notice in writing to the Citizen Minister of Fomento.

Additional Concessions Are Given Anglo-American

Anglo-American Oil Company, Ltd., in continuing its search for oil, started 10 years ago, in the United Kingdom, recently acquired additional prospecting licenses in Southern England totaling 1790 square miles. Acreage under license by the company now totals 3962 square miles.

Anglo-American currently is drilling its Gringley 1 wildcat test Nottinghamshire, about 12 miles south of Belton, near Gainsborough. At last report, the test was below 3000 feet with projected depth being 5000 feet.

Late in 1945, the company's Belton 1, in the peat-covered plains between Doncaster and Scubthorpe, was abandoned at 5459 feet.

The company also has deepened its Well 6 in the small Midlothian oil and gas field near Dalkeith, Scotland, to a series of sands proved to be gas bearing in Well 1. However, these sands were found to be very poor and thin in Well 6 with the daily gas volume very low.

Big German Synthetic Plant Moved to Poland

The German-built synthetic gasoline plant at Schwarzheide near Dresden, Central Germany, one of the pillars of German motor fuel supply during the war, is now on its way to Poland, transported by the Red Army, according to a recent announcement by the Warsaw radio.

The report stated that the plant's capacity is 40,000 tons anually (about 931 barrels daily). However, information from Germany says that the original capacity was about 3450 barrels daily, indicating that most of the plant's capacity was knocked out during the war.

Dutch Harbor Terminal

Reopening of its big petroleum products terminal at Dutch Harbor, in the Aleutian Islands, which has been operated by the Navy since the outbreak of the war, has been announced by Standard Oil Company of California.

Oilfield Equipment to South America

A 75-ton, stiff-leg derrick is shown hoisting a 25-ton oil barge from the offshore side aboard a Lykes Bros. Steamship Company steamer berthed at the Long Reach docks of the Houston Wharf Company, Port of Houston. The barge will be shipped to Venezuela.

Phillips Shipping More Rigs for Venezuela Work

Phillips Venezuelan Oil Company, subsidiary of Phillips Petroleum Company, now has three rigs operating in Venezuela and is shipping three additional rigs to that country. One of the rigs is for heavy duty, capable of drilling below 10,000 feet, and probably will be used in wildcat work.

Five of the rigs will be used in the development of the company's indicated field on its 25,800-acre Mata Grande concession in the state of Monagas, Eastern Venezuela, where the company's first test in Venezuela recently blew out at around 4700 feet. The strike is immediately southwest of the Travieso field. The company is beginning the construction of a modern employe camp near Santa Barbara.

Phillips Venezuela holds concessions on about 875,000 acres in the South American country.

Superintendent Named

Tom C. McChesney has been appointed drilling superintendent for Phillips Venezuelan Oil Company, subsidiary of Phillips Petroleum Company, and will leave for Venezuela about mid-July. McChesney has been engaged in the drilling end of the petroleum industry since 1919, working for various contracting firms in many parts of the Mid-Continent area until 1941 when he joined the drilling department of Phillips Petroleum Company.

Production by Bolivia Shows Decline in January

Crude oil production in Bolivia during January, 1946, amounted to 30,215 barrels, a decline of 6.6 percent from the 32,365 barrels produced during December, 1945.

Statistics of Yacimientos Petroliferos Fiscales Bolivianos, the government-controlled company, reveal that January output in the three producing fields as follows: Camiri, 11,897 barrels; Bermejo, 10,168 barrels; and Sanandita, 8150 barrels.

Combined output of refined products in the Camiri and Sanandita refineries totaled 21,250 barrels, or 6.8 percent, over the December, 1945, total.

Exports of fuel oil to Argentina from the Sanandita field again increased in January, amounting to 1757 barrels, compared with 1337 barrels in December, 1945. Exports of crude petroleum to Argentina from Bermejo fell off sharply, totaling only 6005 barrels in January, as against 11,186 barrels in December.

Poland and Netherlands Accept War Loss Claims

American oil companies and other nationals who suffered war damages in Poland and The Netherlands may now file claims for compensation with the governments of those countries although neither has yet made provision for their payment.

In the case of losses in Poland, appropriate forms for the filing of claims must be obtained from the War Losses Department, Central Office of War Reparations in Warsaw, and may be filed direct by a resident of Poland holding a power of attorney or forwarded to the American Embassy at Warsaw for filing.

Claims for losses in The Netherlands may be filed with The Netherlands Commission for War Damages at The Hague or the office of The Netherlands Financial Counselor in New York.

Decline in Ecuador Oil First-Quarter Production

Production of crude oil in Ecuador during the first quarter of 1946 amounted to 580,460 barrels, according to official statistics. This is a decline of 11 percent from the 652,222 barrels produced in the corresponding quarter of 1945. Output in the fourth quarter of 1945 was 650,268 barrels.

Gas Exportation Order Accentuates Mexico Trend

Increased exports of Texas natural gas to Mexico, under authority of the U. S. Federal Power Commission, will accelerate an already increasing trend. There was a steady expansion of gas movement southward across the Rio Grande during the war years.

U. S. Bureau of Mines figures covering exports to Mexico show exports of natural gas during the last few years as follows (in thousand cubic feet): 1942, 5,432,489; 1943, 7,957,258; 1944, 10,008,193; and 1945, 12,873,732.

Mexico has four producing gas fields in the north. They are the Rancherias field near Camargo, the La Presa field west of Mier, the Mier-Lajitas field southwest of Mier and the new Mision field recently opened west of Reynosa.

To the end of 1945, these gas fields had produced a total of 30,094,000 MCF. Producing rates for the year 1945 (in thousand cubic feet) were as follows: Rancherias (8 wells), 24,320; La Presa (3 wells), 138,865; Mier-Laj (7 wells), 592,597; and Mision (1 well), 271,078; for a total of 1,026,860.

There is little question but that additional gas reserves can be located in northeastern Mexico when and if the Mexican government sees fit to open up that country. In the meantime, however, the industries of Monterrey will be more than glad to get an additional 12 to 14 million MCF of gas per year, regardless of where it comes from.

The United States Federal Power Commission on June 12 authorized Reynosa Pipe Line Company of Texas to export and sell up to 40 million cubic feet daily of natural gas to the Gas Industrial de Monterrey, a Mexican company.

The authorization given Reynosa Pipe Line Company is contingent on their obtaining a certificate of public necessity and requires the construction of some 30 miles of gas line in Texas.

The Commission's order also limits the gas to be exported to that produced by the fields of La Blanca, North Weslaco and South Weslaco from the properties of the La Gloria Corporation.

Foreign Guests at Nomads Meets

Foreign visitors at last week's meeting of Houston Chapter Nomads are shown in the top picture left to right as follows: Front row—G. E. Baboin, Schlumberger Corporation; Ralph Emery, Asiatic Petroleum Company; P. Bayle, Texowell Service and Machine Company. Back row—J. G. Dommien, Materials Section, French Government; Tom McChesney, Phillips Petroleum Company of Venezuela; O. B. Rylander, Socony-Vacuum Oil Company of Venezuela; I. B. Rollins, Standard Vacuum Oil Company, Sumatra, N.E.I. and D. J. Rueb, Asiatic Petroleum Company. (Photo by Bourdon.)

These and other guests and members heard J. L. Mathieu, vice president in charge of export operations, Schlumberger-Surenco of Venezuela give an illustrated talk on oil industry operations in Colombia. He had just returned from a South American trip. Ed H. Fisher of Pacific Wire Rope Company and E. C. Leonardon of Schlumberger were inducted as new members. Houston Chapter Nomads will next meet July 8 at Ye Olde College Inn.

Los Angeles Chapter Nomads foreign visitors are shown in the lower photo, left to right, as follows: Front row—Gordon H. Smith, W. C. Eyre and Robert B. Laughbaro all of Arabian American Oil Company and C. H. Major. Back row—J. W. Clampitt, Iraq Petroleum, Kirkuk; Florent H. Bailly, Pantepec Oil Company, Cacaras, Venezuela, and J. P. O'Mara, Tipsa, Argentina. Bailly was the speaker at this, the June, meeting.

Canadian Oil Industry Construction Progresses

Work will begin immediately on the erection of a modern concrete building to replace the oil laboratory at South Westminster, British Columbia, destroyed recently by fire. D. W. Ross, who was in charge of experiments conducted at the destroyed plant, says the new building will be fully protected with automatic fire prevention apparatus. Before the fire, experimental work was being conducted at the laboratory on extracting oil from Fort Norman's tar sands.

Home Oil Distributors, Ltd., are building a bulk petroleum plant at Port Alberni, British Columbia. The gross capacity of the bulk products is 52,000 gallons.

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Switch from Coal to Oil Evident As One of Europe's Postwar Trends

The trend toward the use of oil instead of coal as power is once again developing in Europe. This trend first gained momentum following World War I when the world fleets started converting from coal to oil on a large scale.

Reports from Moscow say that a changeover from coal to diesel traction is planned in the Soviet Union over a length of some 4000 miles of railways during the next few years. During the first quarter of 1946 the Ashkhabad railway switched over to diesel traction for both passenger and freight traffic. The Gudermes - Kizyar - Astrakhan line is scheduled for complete conversion by the end of the year.

In the near future diesel engines will also be used on the railway line linking the port of Tuapse, which before the war carried the bulk of oil exports from Grozny, to Sochi and Sukhum. During the last three months of 1946 the first postwar-built Russian diesel railway engines will come into operation. In connection with these new plans for using oil in place of coal, it is interesting to note that so far the plans are confined to regions of southern Russia near the Caucasus and Caspian Sea oil regions, thus saving long-distance transportation of oil fuel.

With coal still very much under control and unlikely ever again to be available at a cost comparable with that which obtained prewar, British consumers, domestic, commercial and industrial, are turning increasingly to the use of oil. Apart from the obvious and established uses, as in domestic central heating, where coal systems are being converted, there has been a significant move in the fishing industry, long an established coal-consuming customer, to change over to oil.

New building recently constructed has accepted the principle of oil for fuel, in an effort to cut running costs on both fuel and labor. The conversion of older vessels is rather a different matter, since few owners would care to commit themselves at this stage to a definite opinion as to the trend of future prices and the relative costs of coal and oil operation on an older ship. However, one company has taken such a decision and will undoubtedly be watched by all other units in this important Scottish and English industry, to determine to what extent this transfer from coal to oil has been justified.

Austria Claims Third Rank In European Oil Production

Austria has become third in rank among European oil producing countries, being surpassed only by the Soviet Union and Roumania, the Austrian press claims. At the same time it was stated that Vienna itself is now regarded as a major potential center for natural gas.

Several wells have been drilled to depths of more than 3200 feet at Aderklaa, at the outskirts of Vienna. Natural gas has been developed and this is now being used, together with that from other areas, for blending with town gas distributed in the municipal mains.

Attention is also drawn to the probable existence of natural gas below the central port of Vienna, like the area of Ostbahnhof, one of the capital's main railway terminals. Another new feature is the refinery at Braunau on River Inn in upper Austria, built since the country's liberation and now said to be an important asset in Austria's national economy. Owned by a company hitherto unknown—Max Humer—this plant lies in the American zone of occupation, whereas all the old established plants are in the Russian zone. Actual production is only 110 tons (about 880 barrels) of motor and other lubricating oils monthly but a marked increase in its output is expected later.

Carter for London Post

A. F. Carter, former Houston oil man, and lately a rear admiral in the Navy, has been appointed resident director in London of the newly-organized United Overseas Petroleum Company, Ltd.

The company was formed by The Texas Company and Standard Oil Company of California as a service corporation to handle affairs of their joint foreign operations.

Australia Activity

Work on the Lakes Entrance oil shaft project in Victoria, Australia, has been resumed by the Austral Oil Drilling Syndicate. The pilot well has been deepened five feet and the yield of oil, subject to dehydration, increased from 40 pints to 40 gallons daily.

Soviet Union Planning Huge Geological Staff

Ten thousand Soviet geologists will participate during the forthcoming five years in carrying out the USSR big program to provide for the increasing requirements of industry in every type of mineral raw materials, according to Ilya Malyshev, president of the Government Committee for Geology.

Geological maps covering some 5 million square kilometers (1200 million acres) of territory will be made within the next five years. To step up explorations, seismic methods, prospecting with means of electric appliances, gravimetrics, magnitometrics, radiometrics, thermometrics and other methods will be employed widely, Malyshev has declared.

A special research center, the Institute of Prospecting Technique, has been established to evolve methods and tools for prospecting and working new mineral deposits. The Institute of Mineral Raw Materials also has been established, and is engaged in chemical analysis of ores.

Prospecting of subterranean waters is to be an important part of the work. Fundamental studies of USSR geology will be published within the next five years.

Netherlands Plant Resumes

The petroleum refinery located at Pernis near Rotterdam, Netherlands, resumed operations on April 5, 1946, according to the *Foreign Commerce Weekly*.

Although 25 storage tanks, 70 working tanks, 115 pumps, and 280 electric motors were destroyed or removed, and considerable other damage was done during the war, storage capacity of 465,000 cubic meters (about 2,883,000 barrels) had been restored by April 1. Prewar storage capacity was 745,000 cubic meters (about 4.6 million barrels).

German Allocation

The monthly allocation of petroleum, oils and lubricants for the U. S. zone of Germany for the last half of this year has been fixed at 36,200 metric tons (253,400 barrels), the same as for April, it was reported to the Department last week by the military government.

Of the total, Bavaria is to receive 52 percent, Greater Hesse 26 percent and Wuerttemberg-Baden 22 percent. About half of the gasoline is allocated to Bavaria.

Political Disturbances May Change Route of Trans-Arabian Pipe Line

CURRENT political disturbances in Palestine, Transjordania and Syria may dictate routing of the Trans-Arabian pipe line to Alexandria rather than to Haifa or other areas of the Lebanese coast. A memorandum to that effect, it is understood, has been passed among the personnel of the Near East Division of the State Department at Washington. However, the Arabian American Oil Company, joint subsidiary of The Texas Company and Standard Oil Company of California, declares that it still has not decided on the Mediterranean outlet for the line from the Persian Gulf area.

The present outbreaks of violence in Palestine and the Transjordan region, together with the withdrawal of British and French forces from Syria and Lebanon, make it highly doubtful, industry sources believe, that the Trans-Arabian line can be laid along the originally projected route through British-mandated territory. It is now said that the line likely will run northwest from the Saudi Arabian fields along the northern edge of the Great Nefud Desert, thence westward or southwestward to Alexandria. Final decision, the company says, will be made in accordance with the grouping of all factors at the time when construction begins.

Trouble in Syria

The Syrian area recently has become the trouble center of the whole Middle East. The situation is highlighted by a threefold course of events:

1. Convention of the Arab League in extraordinary session in Bludan, Syria, and the League's demand that the British mandate over Palestine be transformed as quickly as possible into a new "trusteeship" under the United Nations Charter.

2. Evacuation, June 6, of British and French troops from Syria. The removal of the forces has raised acute problems of national and internal security.

3. The conflict which has become intensified between Jews and Arabs following the ten recommendations of the Anglo-American Committee on Inquiry in Palestine, principal proposal of which was the admission of 100,000 Jewish refugees to Palestine immediately.

The difficulty has been emphasized with the appearance of the Grand Mufti of Jerusalem at the Syrian embassy in Cairo following his mysterious flight from France. The Mufti, Haj Amin el Husseini, is an anti-British leader of long-standing, having fought with the Turkish army against Britain in World War I. More recently he was the leader of the pro-Axis revolt in Iraq during the last war. He is a powerful Arab figure still, as is shown in the June 12 announcement of the League that the Mufti had been named spiritual head of the League's executive committee. It is clear that the Arabs will resist British or American influence in favor of a Zionist state.

French May Be Involved

The Mufti's dramatic escape from France supports the suspicion that the French themselves may have had a hand in the incident. The French have been very unwilling to withdraw troops from the Middle East, and internal disturbances there would point to the need for continuance of French power at least in Syria. One oil man recalled to THE OIL WEEKLY that identical tactics were adopted by the French during the Mesopotamian uprisings of 1920.

Back of all the turmoil stands Russia. Moscow has been wooing the Arab world and the fruits of her policy are now in sight. The influence of the Soviet Union is steadily moving to the West; the latest incident of which is the diplomatic clash with Turkey over the position of the Kurdish tribes. This issue brings Russia right to the Syrian coast, and Russian prestige may fill the void left by the withdrawal of the British and French.

All these considerations complicate greatly not only the route of the Trans-Arabian pipe line but its very existence as well. If the line materializes, it probably will be of at least 24-inch diameter, possibly 26-inch, and with a length of 1000 miles, and for the greater part of its route will skirt the Great Nefud, which is ideal terrain. To avoid extensive course through Palestine or Transjordania, the line would have to swing south sharply. It would be possible to miss both Palestine and Transjordania by passing them to the south, across the Sinai Peninsula, direct into Egypt. Events of the last few weeks make this route the most logical choice at the present time.

Long Named Assistant

A. C. Long has been named assistant to the vice president of the foreign operations department of The Texas Company, C. E. Olmsted, foreign operations vice president, has announced.

A. C. Long

Long was formerly manager of the foreign executive sales division, and has been with the company, serving in various capacities in foreign and domestic operations since 1930. For 14 months beginning in 1941 he was on military leave in government service, during most of which time he was petroleum attache for the State Department in London.

Godber Named to Succeed Lord Bearsted With Shell

Lord Bearsted, chairman of Shell Transport and Trading Company, Ltd., will retire from that position on July 12, 1946, a move made necessary by ill health.

Sir Frederick Godber has been appointed as his successor, and his vacated position as managing director of the major operating companies of the Royal Dutch Shell Group of companies will be filled by Frank Hopwood.

Hopwood was stationed in New York from January, 1942, until May of 1945, as president both of Asiatic Petroleum Corporation and The Caribbean Petroleum Company. During that time he was actively associated, through PAW appointed industry committees, with the coordination of the petroleum resources of the Allies, and was the representative in the United States of the British Petroleum Board.

Anglo-Iranian Changes

Sir Edward Packe has resigned his post as an ex-officio director appointed by the treasury on the board of Anglo-Iranian Oil Company because of ill health. Sir George Barstow has also requested that, because of other business, he should be relieved of his duties as an ex-officio director of the company.

The vacancies will be filled by Field Marshall Viscount Alanbrooke and Sir Percival Robinson. Lord Alanbrooke will take up his new duties after his retirement from the post of Chief of the Imperial General Staff at the end of June.

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Monthly International Section

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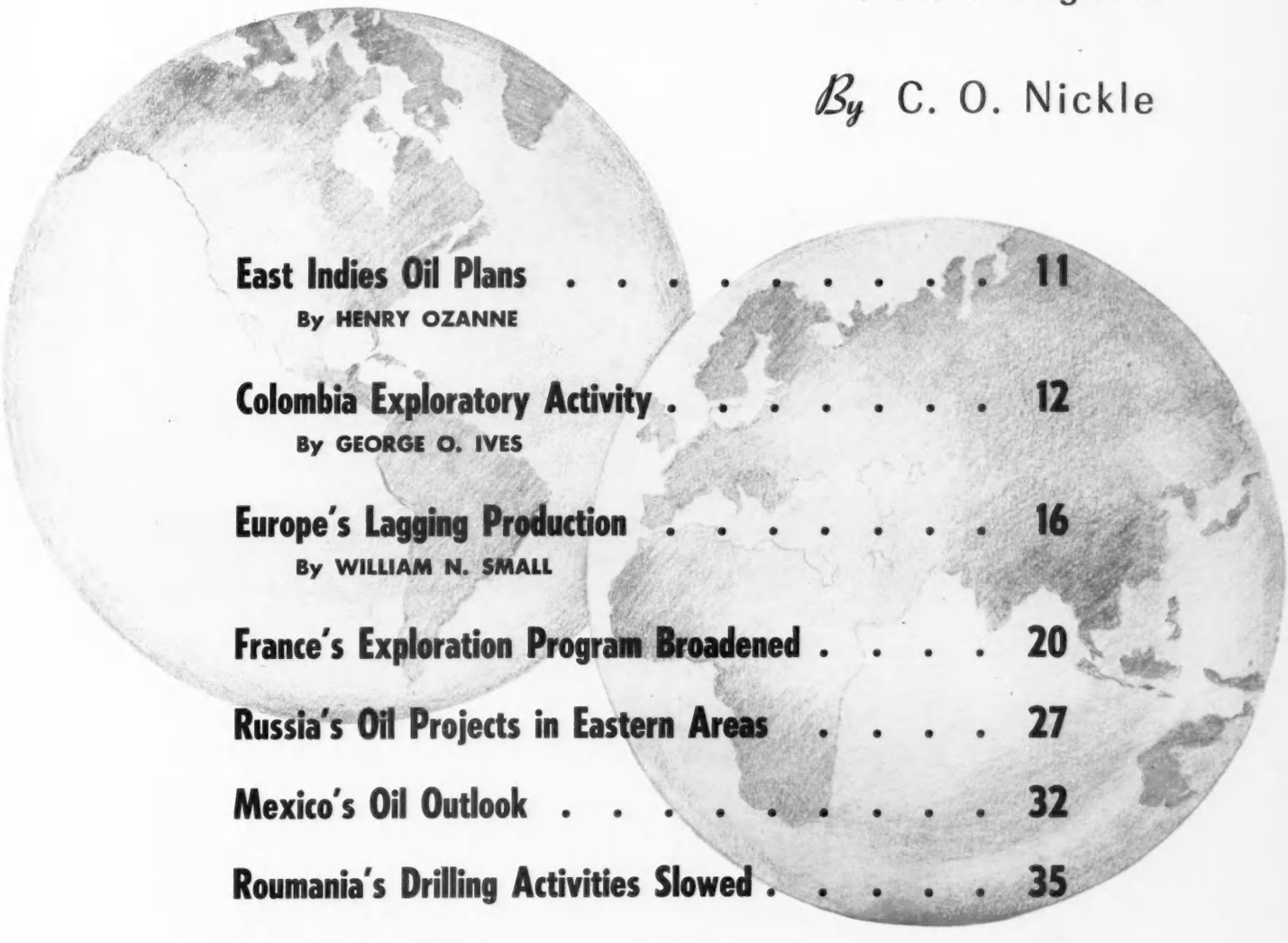
By C. O. Nickle



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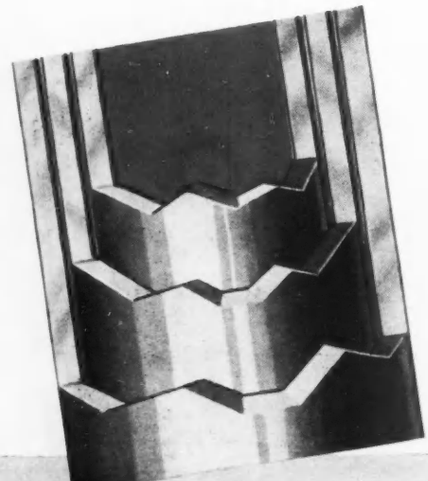

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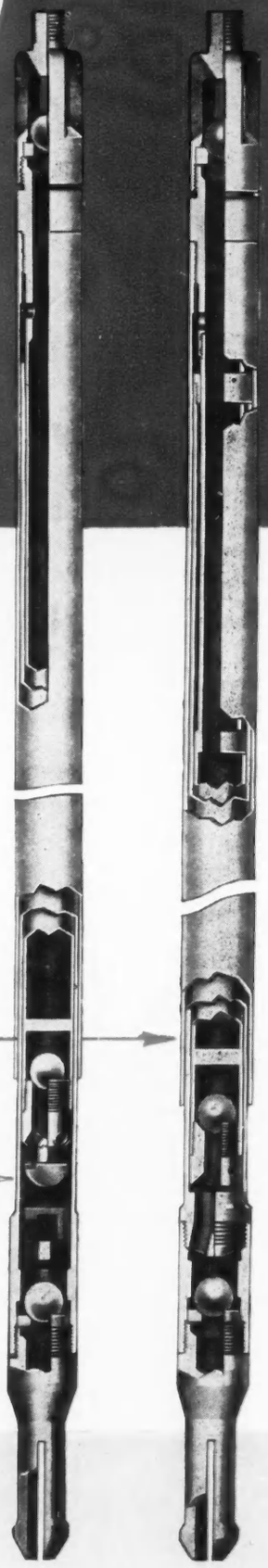

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By C. O. NICKLE, Staff Writer

Western Canada Midyear Report

THE Canadian government's wartime taxation concessions, designed to encourage oil and gas exploration and development, have been extended to December 31, 1947. These concessions, which are in addition to normal depletion and depreciation allowances, permit writing-off of 26⅔ percent of cost of successful wells; 40 percent write-off of geological, geophysical and drilling costs of exploratory dry holes, and 50 percent of dry-hole costs if well is approved as a "deep test" by the government. The concessions were originally slated to expire March 31, 1945, were subsequently extended to the end of 1945, the end of 1946, and now to the end of 1947.

To the major and independent concerns active in oil and gas exploration and development in Western Canada, the extension came as welcome news. It is expected to insure during the remainder of 1946 and in 1947 a continuation of the large-scale program which has been under way the past three years.

During the first half of 1946 that program has brought some favorable results. It hasn't yet, however, brought a major oil discovery to replace the great, but waning, Turner Valley field.

During the first half of the year operators drilled 37 wildcat tests, of which 12 succeeded in opening new areas or extending production. During 1945 there were 54 wildcat tests drilled with 11 successfully completed.

Year's Highlights

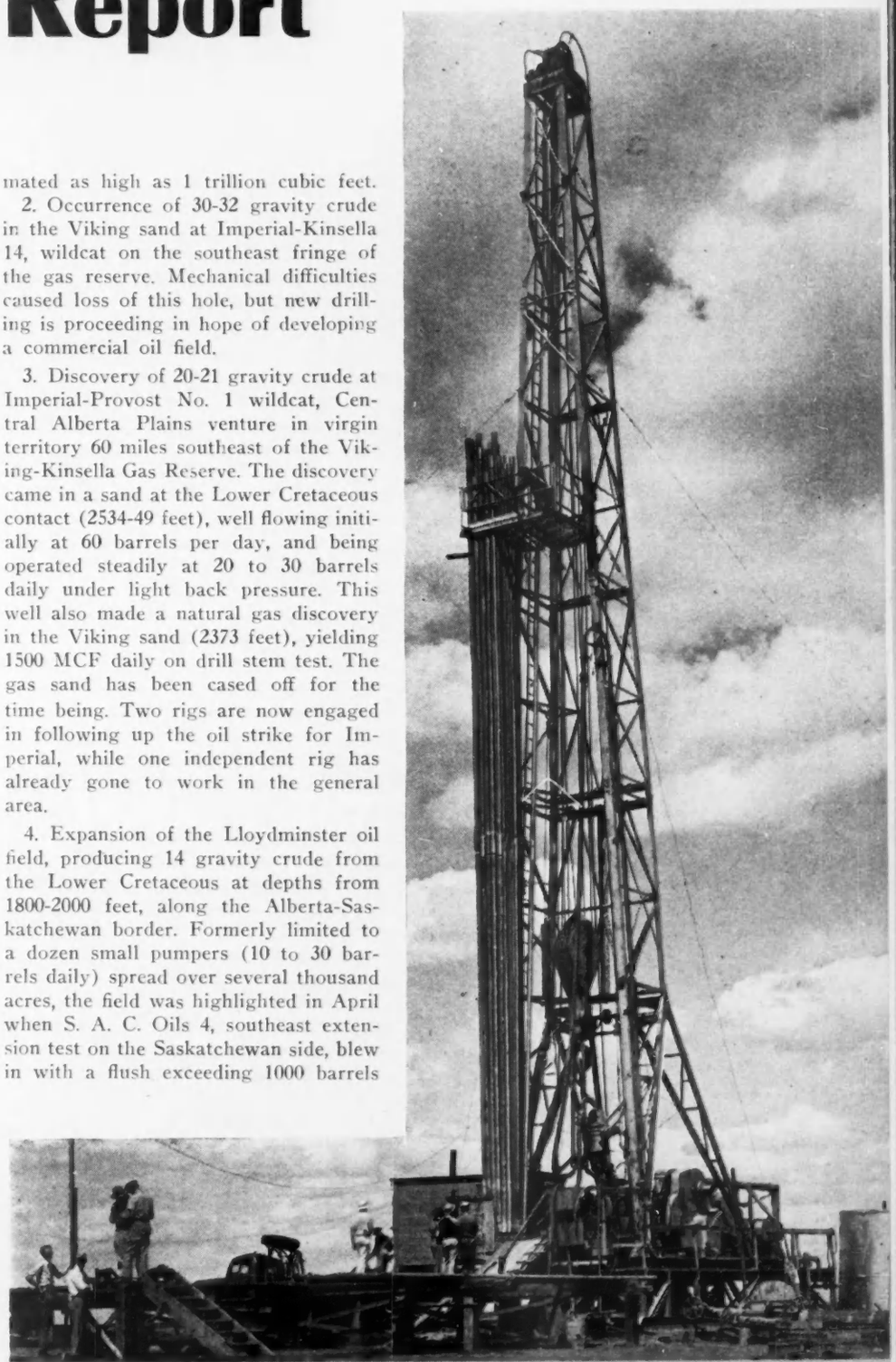
Highlights of the first half of this year include:

1. Addition of some 150,000 acres to the proven area of the Viking-Kinsella natural gas reserve on the Central Alberta Plains by a series of widely spaced Imperial Oil, Ltd., wildcats. By the end of June, the indicated proven area of the reserve was about 250,000 acres. Gas source is the Viking sand of the Upper Cretaceous, found at depths from 1930 to 2100 feet. Recoverable reserve is estimated as high as 1 trillion cubic feet.

2. Occurrence of 30-32 gravity crude in the Viking sand at Imperial-Kinsella 14, wildcat on the southeast fringe of the gas reserve. Mechanical difficulties caused loss of this hole, but new drilling is proceeding in hope of developing a commercial oil field.

3. Discovery of 20-21 gravity crude at Imperial-Provost No. 1 wildcat, Central Alberta Plains venture in virgin territory 60 miles southeast of the Viking-Kinsella Gas Reserve. The discovery came in a sand at the Lower Cretaceous contact (2534-49 feet), well flowing initially at 60 barrels per day, and being operated steadily at 20 to 30 barrels daily under light back pressure. This well also made a natural gas discovery in the Viking sand (2373 feet), yielding 1500 MCF daily on drill stem test. The gas sand has been cased off for the time being. Two rigs are now engaged in following up the oil strike for Imperial, while one independent rig has already gone to work in the general area.

4. Expansion of the Lloydminster oil field, producing 14 gravity crude from the Lower Cretaceous at depths from 1800-2000 feet, along the Alberta-Saskatchewan border. Formerly limited to a dozen small pumpers (10 to 30 barrels daily) spread over several thousand acres, the field was highlighted in April when S. A. C. Oils 4, southeast extension test on the Saskatchewan side, blew in with a flush exceeding 1000 barrels



Light mast-mounted rotaries handle the bulk of drilling on the Canadian plains to depths of 1500 to 4500 feet. The above rig is on a wildcat north of Princess.

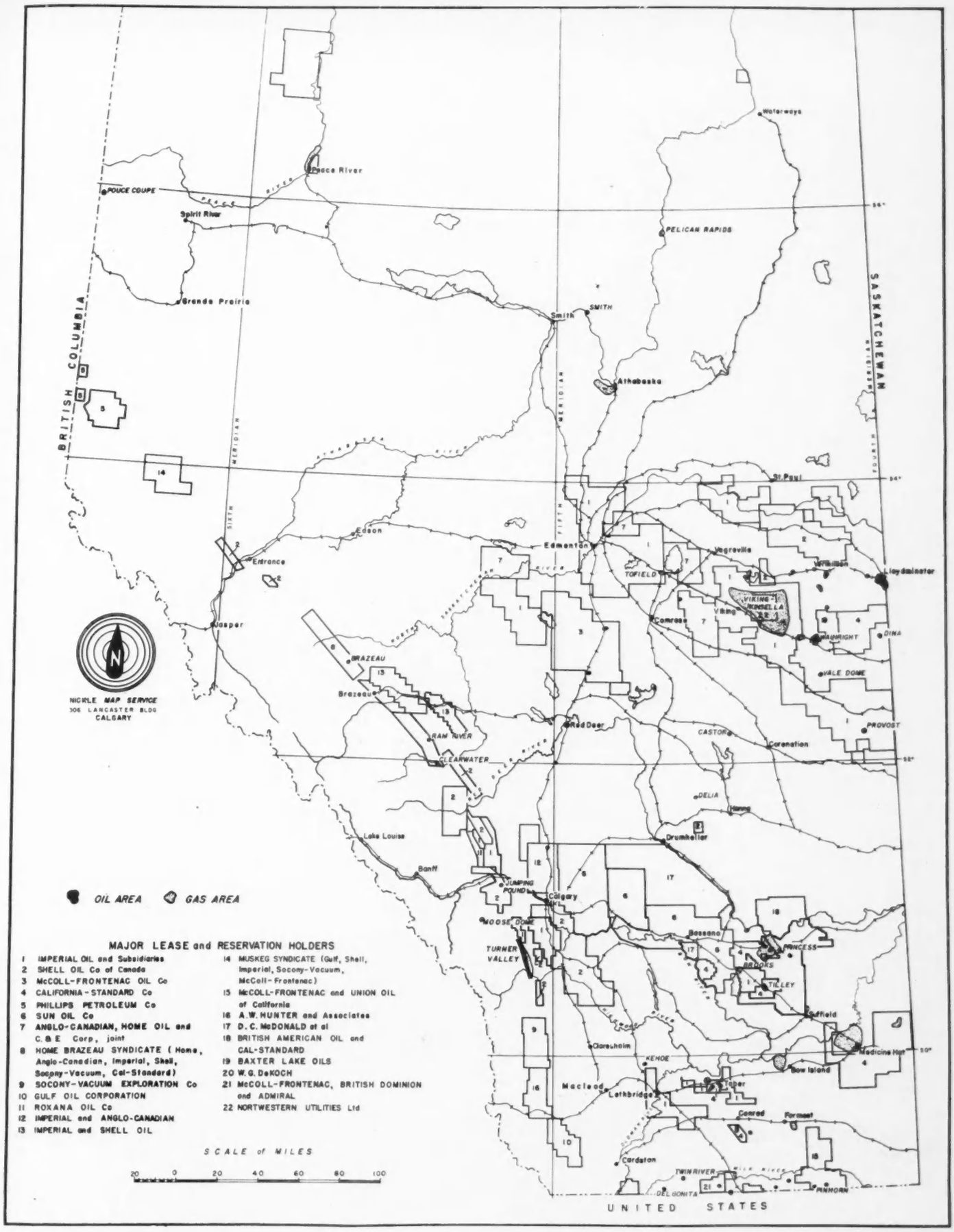
daily. Rapidly settling, that well is now pumping 80 to 100 barrels daily. It has been followed up by a string of wells ranging on pump from 20 to 75 barrels daily.

5. The West Taber oil field of the South Alberta Plains, developed slowly since its discovery in 1944, received a boost in May when Standard Oil Company of B. C.-Nassau Explorations' Taber-Province 65-15A completed with a flow of 250 barrels of 24 gravity oil per day from the "Taber sand" (Lower Cretaceous) at 3220 feet. The well, first flowing well in a field of pumpers ranging from 25 to 70 barrels daily, is maintaining a flow of 120 barrels daily under substantial back pressure. A southeast stepout from previous completions, the well has caused Standard to restudy the area, and considerable followup development is expected.

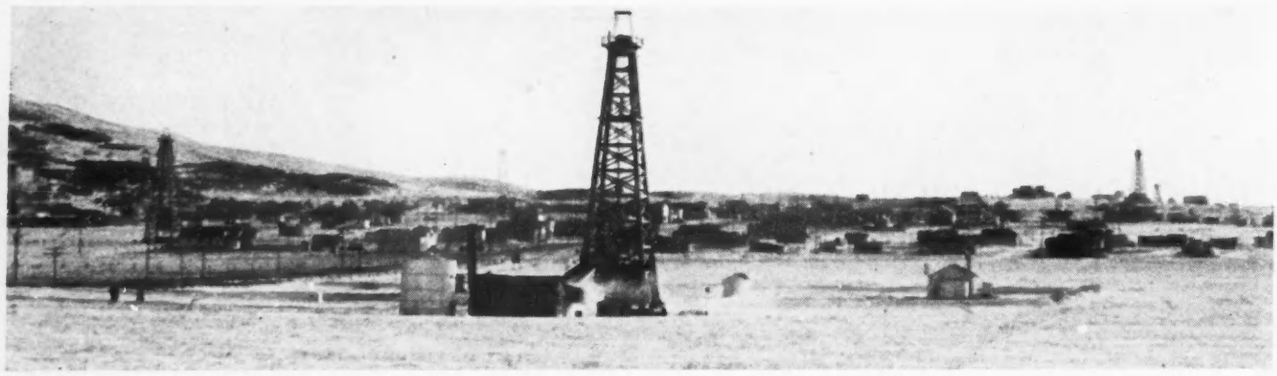
6. Encouragement at the Home-Brazeau Syndicate 1, wildcat on the indicated huge Brazeau Anticline in the Central Alberta Foothills. Drilled on the seismograph-indicated structure crest, and close to the faulted east edge of the Madison limestone block, the well found lime at 9498 feet, faulted out at 9597 feet, re-entered lime at 11,351 feet and faulted out again at 11,599 feet. Only slight porosity showed in the two limestone slivers. Both slivers proved gas-bearing and water-free. The lower section gave 50 MCF of gas. The upper section gave 500 MCF of gas and a show of oil initially, and was upped to 10,500 MCF of gas and 3.5 barrels daily of 50-52 gravity oil after acidization. If greater porosity exists down flank to the west, there is a reasonable prospect

Alberta (Canada) Wildcat Completions in First Six Months of 1946

COMPANY, WELL AND LOCATION	Date Completed	Total Depth (Feet)	RESULTS
Alberta Foothills Belt:			
Home-Brazeau Syndicate's No. 1, Brazeau, lsd 5 17-43-17w5th (Backers: Imperial, Shell, Home Oil, Anglo-Canadian, California-Standard, Socony-Vacuum)	Feb. 28	11,689	Gas Discovery; topped Madison Limestone 9498 ft, faulted to Fernie 9597 ft, re-entered Madison 11351 ft, faulted back to Blairmore 11599 ft; lower Madison sliver gave 50 Mcf gas, no oil or water; plugged back to 9696 ft; upper Madison sliver gave 500 Mcf gas, show of oil, no water; flow upped to 10,500 Mcf gas, plus 3.5 bbls daily 50-52 API oil, after acid treatments totaling 4000 gallons; well closed in May 28 after tests.
Consumer's Co-operative Refineries' Co-op No. 1, Stimson Creek, lsd 11 22-17-2w5th	Apr. 14	10,923	Abandoned; Madison Limestone 10,736 ft, showed salt water; oil and gas showings above lime not commerical.
Phillips Petroleum Company's Sullivan Creek No. 2, Sullivan Creek, lsd 8 22-18-5w-5th.	May 23	3500	Abandoned; bottomed in Fernie shale; hole mud-filled, cement plug at shoe surface pipe 385 ft, permitting resumption if later decided on.
Home Oil Company's Home-Millarville No. 20, North Turner Valley Extension, lsd 7 24-21-4w5th	Feb. 21	9771	Abandoned, completed in Madison lime, topped 9310 ft; Upper Porous zone, 9410-9515 ft, yielded water.
Home Oil Company's Home-Millarville No. 21, North Turner Valley Extension, lsd 11 34-21-4w5th	Feb. 12	9972	Abandoned, completed in Madison Lime, topped 9582 ft; Upper Porous zone 9655-9745 ft, yielded water.
Foothills Oil & Gas Co.'s No. 23, East Side Lime, Turner Valley, lsd 3 9-21-3w5th	Jan. 17	8726	Oilwell, extension completion; completed in Madison lime, topped 8320 ft; porous lime 8390-8485 ft, 8655-8715 ft; flush after acid 38 bbls per hour 41 API oil.
Foothills Oil & Gas Co.'s No. 24, East Side Lime, Turner Valley, lsd 15 4-21-3w5th	June 19	866	Oilwell, extension completion; completed in Madison lime, topped 8140 ft; porous lime 8235-8360 ft, 8575-8660 ft; flush after acid 70 bbls hourly 41 API oil.
Alberta Syncline Area:			
Imperial Oil and Anglo-Canadian Oil's Crossfield No. 1, Crossfield, lsd 9 11-28-2w5th	Mar. 30	9526	Abandoned, completed in Devonian Dolomite, water showing; Madison lime, topped 8177 ft, showed water; Basal Lower Cretaceous sand 8075-8173 ft, previously cased off, opened with 141 gun-perforator shots and 120 quarts nitro-glycerine, resulting in gas flow 670 Mcf and two bbls daily 47-49 API oil; 38 gun-perforator shots in Lower Benton sands 7160-90 and 7060-7110 ft boosted total gas flow to 835 Mcf.
Southern Alberta Plains:			
California-Standard Co.'s Foremost-Province No. 4, Foremost, lsd 28-5-11w4th	Jan. 28	4252	Abandoned; completed in Devonian Dolomite, water showing.
Imperial Oil Ltd's Lethbridge No. 1, Lethbridge, lsd 3 10-8-22w4th	Jan. 3	4700	Abandoned, completed in Madison limestone, water showing.
California Standard Co.'s Princess-CPR No. 38-31-19-11, Princess, lsd 15 31-19-11w4th	Jan. 4	4120	Abandoned; completed in Devonian Dolomite; water showing.
P. S. & D.-Princess-Globe Syndicate No. 1, Princess, lsd 2 3-20-12w4th	Jan. 4	3420	Abandoned; completed in Madison Limestone; water showing.
California-Standard Co.'s Burdett-Province No. 4, Burdett, lsd 16 13-7-13w4th	Feb. 25	3209	Abandoned; completed in Madison Limestone; water showing.
California-Standard's Conrad-Province No. 57-33B, Conrad, lsd 14 33-5-15w4th	Mar. 20	3026	Oilwell; Extension completion; initial yield 42 bbls daily 25 API crude oil from Ellis sand.
California-Standard's Irvine-Province No. 28-32-11-2, lsd 16 32-11-2w4th	Apr. 23	3385	Gas discovery, abandoned; completed in Madison limestone; water showing; gas flow about 400 Mcf daily in "Medicine Hat sand".
McColl-Frontenac & Union Oil of California No. 11B-6-2-8, Pinhorn, lsd 11-6-2-8w4th	Apr. 25	3303	Abandoned, completed in Madison lime; Madison at 3230 ft; showed water.
Standard Oil of B. C. and Nassau Explorations' Taber-Province No. 65-15A, West Taber, lsd 11 15-9-17w4th	Apr. 21	3220	Oil well, extension completion; initial flow 250 bbls/day 23.7 API crude oil through ¼" choke, casing pressure 300 lbs.; tubing 200 lbs.; gas-oil ratio 250 cu ft per bbl (first flowing well in West Taber area).
Imperial Oil Ltd's Lethbridge No. 2, lsd 15 35-7-22w4th, Lethbridge	May 11	6426	Abandoned, completed in Devonian Dolomite, watrer showing; shows in higher formations not commercial.
McColl-Frontenac & Union Oil of California No. 16D-29-1-9, Pinhorn, lsd 16 29-1-9w4th	May 27	3236	Abandoned, completed in Madison limestone, water showing.
British-American Oil & California-Standard's Wardlow-Province No. 78-23-22-12, Wardlow, lsd 13 23-22-12w4th	June 12	4080	Abandoned, completed in Devonian Dolomite; water showing.
California-Standard's Princess-CPR No. 12-22A, Princess, lsd 1 22-20-12w4th	June 20	4140	Abandoned, completed in Devonian Dolomite; water showing, plus some oil.
Imperial Oil Ltd's Stirling No. 2, Stirling, lsd 7 13-7-20w4th	June 28	3942	Abandoned; Madison lime at 3927 ft; water showing.
McColl-Frontenac & Union Oil of California's No. 4-10-1-8, Pinhorn, lsd 4 10-1-8w4th	June 29	3537	Abandoned; completed in Madison limestone, water showing.
Central Alberta Plains:			
Imperial Oil Ltd's Kinsella No. 4, Kinsella, lsd 11 16-49-9w4th	Jan. 6	1993	Gas discovery, completed in Viking sand; open flow potential 873 Mcf/day.
Imperial Oil Ltd's Kinsella No. 5, Kinsella, lsd 7 11-48-9w4th	Jan. 27	1940	Gas discovery, completed in Viking sand; open flow potential 8,148 Mcf/day.
Imperial Oil Ltd's Kinsella No. 6, Kinsella, lsd 10 11-47-9w4th	Feb. 18	2039	Gas discovery, completed in Viking sand; open flow potential 6,500 Mcf/day.
Imperial Oil Ltd's Kinsella No. 7, Kinsella, lsd 7 22-49-10w4th	Feb. 6	2027	Abandoned, completed in Viking sand.
Imperial Oil Ltd's Kinsella No. 9, Kinsella, lsd 6 16-46-9w4th	Mar. 12	2080	Gas discovery, completed in Viking sand; open flow potential 10,000 Mcf/day.
Imperial Oil Ltd's Kinsella No. 8, lsd 11 22-49-11w4th, Kinsella	Apr. 27	4182	Abandoned, completed in Devonian lime; Viking sand tight.
Imperial Oil Ltd's Kinsella No. 11, lsd 7 28-47-8w4th, Kinsella	Apr. 21	2030	Abandoned, completed in Viking sand.
Imperial Oil Ltd's Kinsella No. 10, Kinsella, lsd 10 29-49-13w4th	May 13	2211	Gas discovery, completed in Viking sand; open flow potential 1100 Mcf/day.
Imperial Oil Ltd's Kinsella No. 12, Kinsella, lsd 7 28-48-8w4th	May 1	1985	Abandoned, completed in Viking sand.
Imperial Oil Ltd's Kinsella No. 13, Kinsella, lsd 10 15-46-10w4th	May 14	2157	Gas discovery, completed in Viking sand; open flow potential 6670 Mcf/day.
Imperial Oil Ltd's Kinsella No. 14, Kinsella, lsd 7 28-45-9w4th	May 29	2048	Abandoned, completed in Viking sand; top section Viking gave substantial gas flow, plus salt water; bottom few feet on 80 minute drillstem test gave 520 ft rise, including 400 ft 30-32 API crude oil, 120 ft rotary mud, no water; casing cemented 2042 ft, plugged off sand. (New well being drilled as potential oil discovery quarter mile north).
Imperial Oil Ltd's Kinsella No. 18, Kinsella, lsd 11 27-45-10w4th	June 26	2268	Abandoned, completed in Viking sand.
Imperial Oil Ltd's Duvernay No. 1, Duvernay, lsd 6 30-55-11w4th	June 19	2798	Abandoned, completed in Devonian lime.
Imperial Oil Ltd's Provost No. 1, Provost, lsd 3 27-37-3w4th	June 12	2549	Oil discovery, lower Cretaceous Contact sand 2534-49 ft, initial flow 60 bbls daily 20-21 API crude oil; Gas discovery, Viking sand, 2373 ft, drillstem testing 1500 Mcf/day (Viking cased off.)



Prepared for this article, the above map marks the first publication of the location of about 12 million acres of leases and reservations of oil and gas rights taken out in Alberta by leading major and independent companies. Considerable rights, held in small blocks, are not shown.



On February 4, Oil Well Reflow Ltd. set off a 5000-quart nitro blast in the Madison limestone producing formation at West Flank 2, depleted oil well in South Turner Valley. Casing split after the shot, delaying cleanout and answer on results. Cleaning operations are to be completed this month. Residents of the neighboring town of Longview were, on the whole, unconcerned on the day of the blast, although some packed their belongings and moved to more distant towns. Some residents of Calgary, 40 miles away, fled the city for fear the nitro would set off a chain reaction of atomic proportions. The actual explosion, 6700 feet down, was unsensational, slightly jarring the ground around the well and kicking out a stream of water from the water-filled hole. Safety devices effectively plugged off the hole. —Photo by Lorne Burkell

of Brazeau establishing an oil and gas field of the Turner Valley type. A decision by the six major and independent backers of the syndicate to drill a new test to the west is expected shortly.

7. Encouragement from the Alberta Syncline—the great trough separating the sharply folded Foothills Belt from the Plains. Imperial-Anglo Canadian-Crossfield 1 found a 98-foot Basal Lower Cretaceous sand (8075-8173 feet), which yielded 670 MCF of gas and two barrels daily of 47-49 gravity crude, with no water, after gun-perforating and shooting. While yield was not commercial, the thickness and nature of the sand encourages hope that future tests in the Syncline area might develop commercial production from the section.

The Lease Picture

As Alberta entered the second half of 1946, in the neighborhood of 12 million acres of petroleum and gas rights were development of the Vera-Unity gas field, under lease or reservation in the province, and an active drilling, geological and geophysical program was continuing. Where that exploration is under way is indicated on the map accompanying this article. This map marks the first publication anywhere of the current Alberta lease and reservation picture in full.

Majors active in Alberta development include: Imperial Oil, Ltd. (Standard Oil Company of N. J.), Shell Oil of Canada, McColl-Frontenac Oil Company (The Texas Company), Gulf Research & Development, Socony-Vacuum Exploration, Sun Oil Company, Phillips Petroleum Company, Standard Oil Company of California, Union Oil Company of California, and British American Oil Company.

In the province of Saskatchewan, bordering Alberta on the east, a fairly active development program is now under way, backed almost entirely by independents. The program was spurred by the extension of the Lloydminster oil field into Saskatchewan, and by the first gas field of any size in that province. Both fields are in the central western section of Saskatchewan. Some 3 million acres of rights have been taken up in their vicinity.

Northeastern British Columbia, Foothills territory tying on to the northwest of Alberta's Foothills and traversed by the southerly part of the Alaska highway, has been the scene of geological and some geophysical work the past three years, principal operators being Socony-Vacuum and Phillips Petroleum Company. Stiff reservation and leasing regulations, however, have so far discouraged acquisition of rights, and has prevented drilling. Socony-Vacuum and Phillips are again in the area this season, and expansion of development is indicated by the fact that the province has created a petroleum and gas division headed by Dr. T. B. Williams, Calgary geologist, whose first task is to set up new regulations along the lines of Alberta's, designed to encourage taking out of rights and the drilling of test wells. The new regulations are expected to go into effect by year's end.

In the Northwest Territories, limelighted during the war years by The U. S. Army's and Imperial Oil's Norman Wells development and McKenzie River oil exploration, the coming of peace and remoteness of the area from any substantial market has virtually halted operations. The Norman Wells field has resumed its prewar role of supplying oil needs of the Far North mining and transport industries. With indicated reserves of some 35 million barrels, the field can supply these needs for several decades at the present rate of demand. Imperial drill tested a considerable number of McKenzie River basin structures, considered comparable to the Devonian Shale Anticline at Norman Wells, but failed to bring other discoveries, without which piping of oil to outside markets would not be feasible.

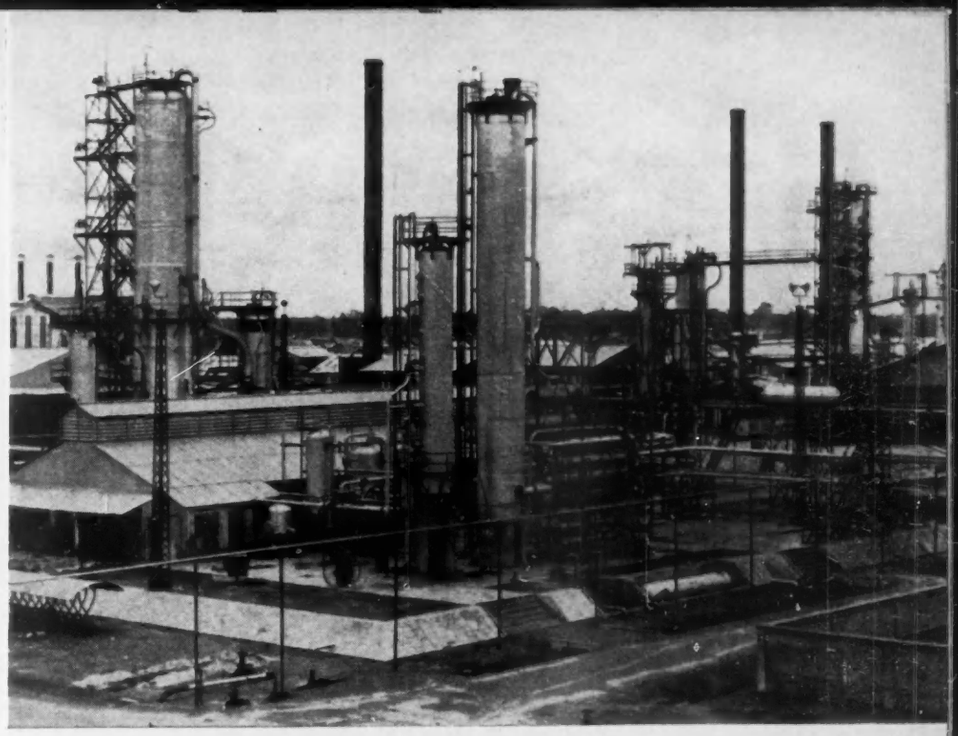
Petroleum Production in Alberta to June 30, 1946

(Figures for June, 1946, Estimated)

FIELD	June, 1945 Barrels	6 Months, 1945	June, 1946 Barrels	6 Months, 1946	Cumul. to 30-6-46
Turner Valley:					
Limestone Crude Oil Wells and Gas Wells	574,678	3,650,058	485,816	3,093,615	78,795,106
Natural Gasoline	26,628	209,882	32,000	212,389	5,640,919
Total Turner Valley	601,306	3,859,940	517,816	3,306,004	84,436,025
Vermilion Oilfield	21,230	127,275	13,954	90,424	746,532
Taber Oilfields	11,257	74,400	17,985	101,302	528,512
Conrad Oilfield	6,339	36,378	18,239	112,606	281,035
Wainwright Oilfield	2,164	7,375	868	5,944	228,969
Princess Steveville Area	4,581	22,152	4,687	33,190	141,302
Lloydminster Oilfield	3,774	11,937	5,698	25,137	65,283
Armelgra Area	.....	.....	.....	.....	462
Dina Area	.....	.....	.....	.....	37,352
Del Bonita Twin River Area	357	2,397	.....	414	31,275
Hay Lake Dome Area	.....	.....	.....	1,140	1,140
Jumping Pound Area	292	1,997	201	1,477	4,948
Keho Lake Area	.....	.....	.....	.....	955
Moose Dome Area	.....	.....	.....	.....	8,977
Ram River Area	.....	.....	.....	.....	207
Red Coulee Oilfield	.....	.....	.....	.....	328,711
Skiff Area	.....	.....	.....	.....	8,298
Tilley Area	183	1,505	.....	.....	14,513
Total Other Fields	50,177	285,396	61,632	371,634	2,428,471
Total Alberta Oil Yield	651,493	4,145,336	579,448	3,677,638	86,864,496

East Indies Oil Plans

By HENRY OZANNE, Staff Writer



Rehabilitation work is progressing on Shell's large refinery at Pladjoe, Sumatra, which suffered considerable damage during the war. The plant is pictured as it was before the Japs struck.

LONG-AWAITED rehabilitation of oil properties in the Netherlands East Indies will be under way shortly, it was disclosed following reversion of all the East Indies except Java, Sumatra and Riouws to the Netherlands Indies government.

With the resumption of Dutch rule, two important announcements were made concerning the petroleum industry in the islands:

1. The Shell Group will construct a Borneo refinery on Maura Island in Brunei Bay, British North Borneo. This plant will replace the Miri refineries destroyed during the war. Maura has a deep water harbor where tankers can be loaded two miles offshore with a pipe line. Shell also announced it will soon resume prospecting for oil in Sarawak, west of Miri; and in Borneo, east of Brunei. It is understood that favorable geological reports have already been compiled on these areas.

2. The American-owned Nederlandsche Pacific Petroleum My. has announced that it has completed plans to resume operations throughout the East Indies as soon as political conditions permit. The company, a joint operating subsidiary of the American Overseas Petroleum Company, which in turn is a joint subsidiary of Standard Oil Company of California and The Texas Company, plans further exploration and development of fields in Central Sumatra. Promising discoveries were made in this region before the Japanese invasion.

Nederlandsche Pacific has reopened offices in Batavia where it has assembled an executive staff and a force of technicians. Before the Japanese occupation the company had explored the Minas field north of Pakanbaroe and west of the Siak River and had put up one derrick.

Recent surveys by industry representatives show that the petroleum industry is in a state of inactivity throughout the Indies. Shell's refinery at Pladjoe, and that of Standard-Vacuum at Soengaigerong, both on the outskirts of Palembang, Sumatra, are still virtually desolate.

However, some of the Sumatran oil fields, nearly all of which are in Indonesian hands, are in fair condition. Others are still wrecked. The Talangakar field was burned out by the Indonesians April 1, but Shell's fields in the Djambi area have a considerable stock of oil products on hand. The fields themselves escaped extensive war damage.

A skeleton force which has been at work at the Pladjoe refineries has effected considerable repair. The plant is now producing only water-purifying pastilles, but if material were available it could rather quickly be put back on a 25,000-barrel a day basis. However, it is estimated that Standard's plant would require several months of intensive repair work.

A Japanese civilian, K Aoki, has been in charge of a staff which has maintained the "South Sumatra Oil Depot." Working there have been 1257 Japanese technicians, 7000 Indonesians, 600 Chinese and 45 British Indian laborers. The depot includes the Pladjoe oil field and the refineries.

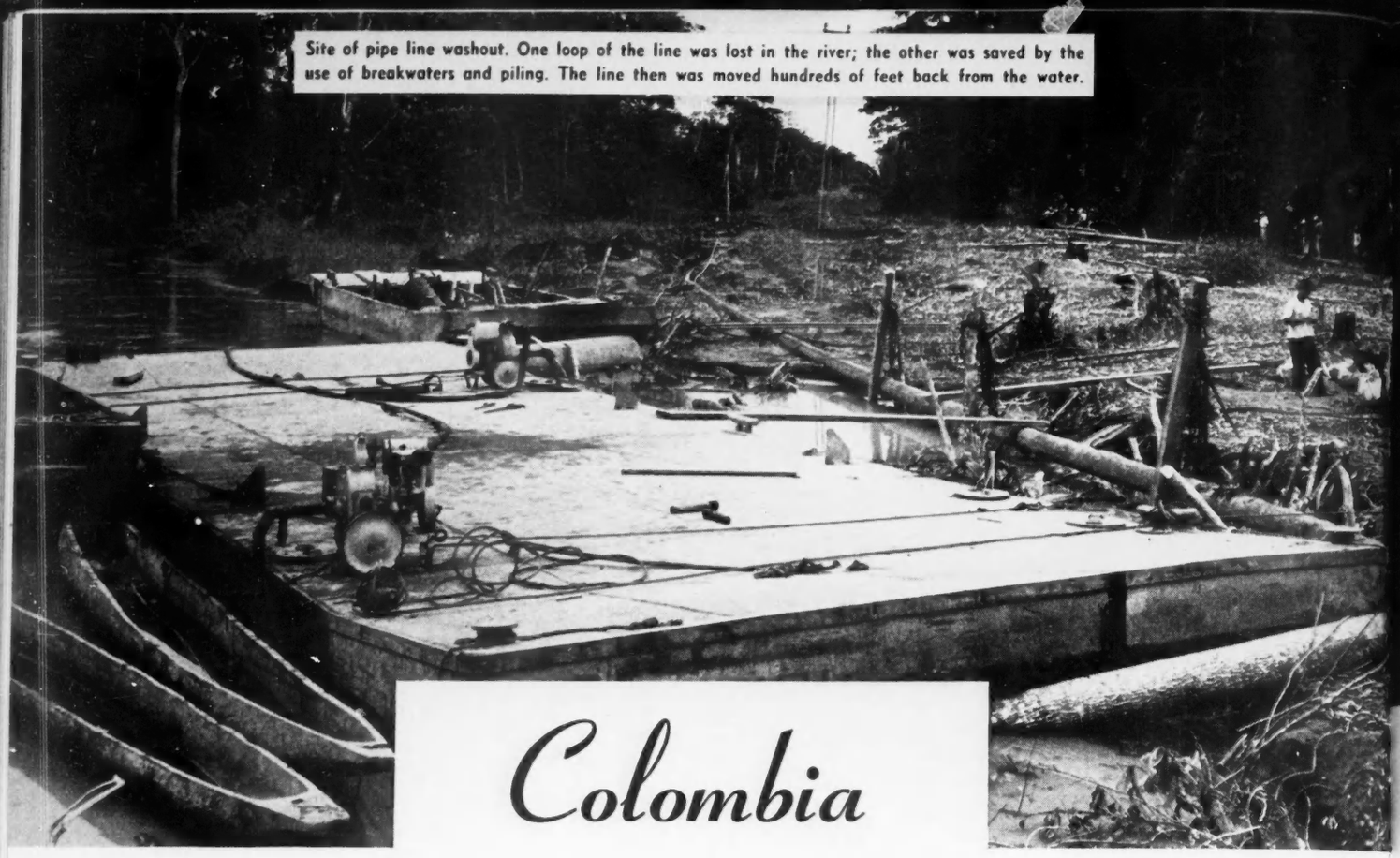
Industry representatives who recently visited the Pladjoe and Soengaigerong refineries were surprised that both these plants still have considerable oil stocks on hand. In May, Pladjoe had 82,000 barrels of crude on hand, 51,000 barrels of gasoline, nearly 10,000 barrels of high speed diesel oil, and 1620 tons of lubricating oil. At Soengaigerong, there are now about 532,000 tons of crude.

Even stocks at the oil fields are relatively heavy; 150,000 barrels are on hand at the Djambi field and about 50,000 barrels at Magoendjaja.

Indonesians have been industrious in their attempt to reestablish an oil industry in Sumatra. In the Magoendjaja region, which they control, they have produced sufficient quantities of gasoline and fuel oil "to provide for the needs of both South and Central Sumatra if current transport difficulties could be overcome so distribution would be possible."

The Indonesian Republican authorities withdraw from the Pladjoe stocks each month about 1700 barrels of gasoline, 2500 barrels of kerosine, and a quantity of lubricating oil. Also, British Navy headquarters at Palembang fill their requirements from these stocks.

A growing number of Dutch and American technicians and business men is congregating in Batavia, awaiting the moment when they will be able to resume work at the refineries. Future operations depend mainly on the resolution of the political issue. The Dutch government is unwilling to use military force against the separatists who hold Java and Sumatra. Many top Dutch officials are in favor of making some agreement with the Indonesians, even to the extent of recognizing the immediate independence of the Javans and Sumatrans, in order to get under way the rehabilitation program.



Site of pipe line washout. One loop of the line was lost in the river; the other was saved by the use of breakwaters and piling. The line then was moved hundreds of feet back from the water.

Colombia

EXPLORATORY ACTIVITY

COLOMBIA is now entering its greatest period of exploratory activity, with six companies actually engaged in drilling wildcats. Seven companies are actively operating in the country, but one (Colombian Petroleum Company) is not engaged in nation-wide wildcatting or geophysical work.

This company is concerned solely with the development and exploitation of the Barco Concession in far northeastern Colombia. The two owners of the company, The Texas Company and Socony-Vacuum Oil Company, are carrying out their exploratory work independently and separately.

Aside from the Barco Concession, which covers 186,805 hectares, the six active companies now hold under firm concession a total of 1,972,553 hectares (4,931,382 acres) and a good portion of this acreage is now being prospected or is scheduled for wildcat drilling soon. The acreage situation is such that at this time there are 31 active concessions, and all are scheduled for tests as required by the law. Under present circumstances any means taken by the government to speed up granting of contracts would leave most of the companies in the position of being unable to fulfill their drilling agreements. Actually, there are very few areas in Colombia into which a company may move in equipment and start drilling within a reasonably short space of time, and government requirements call for spudding a test well within 2½ years of the date of signing the contract. Therefore the volume of exploratory drilling is not likely to increase sharply past the number which will be in operation shortly after the first of 1947.

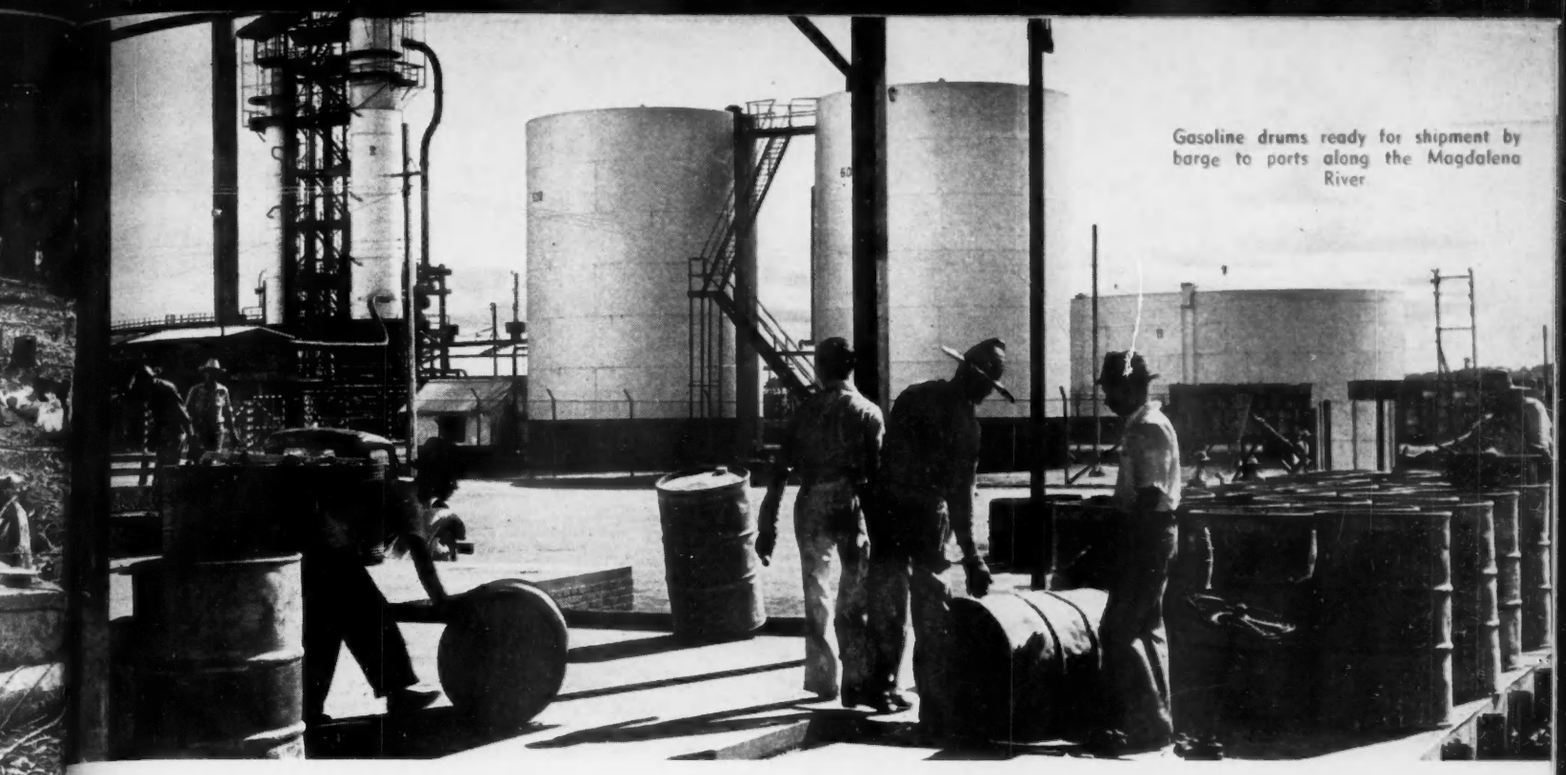
As of the middle of July there were 14 wildcats drilling in the country. Three more rigs were being moved to locations or were already on the ground where wildcat tests were to be drilled. Two more heavy rigs are now in the country, but have not been moved to sites picked for wildcats, and an additional three rigs are on order and scheduled for immediate delivery. All this equipment is for exploratory drilling, and will be kept busy, so that shortly after the first of the year, by which time all are scheduled to be working, there should be 22 rigs engaged in continuous wildcat activity. Much of the equipment is new, and for the most part is heavy-duty, able to drill 10,000 to 12,000 feet.

Apparently Texas Petroleum Company and Tropical Oil Company have the most active and intensive wildcatting campaigns. Each will shortly be running five rigs in various parts of the country. The former's only present operation is the Velasquez 1 in the Upper Valley, where it is expected to open a new oil field, but it has three more rigs in the country and one on order. Tropical is now drilling two wildcats. Costa Rica 1, in the Lower Valley, has reported some shows and Tubara 1, in the north coast area, is drilling below 2500 feet. Shell Oil Company of Colombia has three active wildcats and is moving rig to another location. It has one in the Lower Valley and two in the Llanos, with another rig now moving to the Llanos.

Socony-Vacuum Oil Company has three active wildcats running now, one of which has had trouble fishing out drill pipe and has been at 9310 feet for some time, still cutting and pulling. The same operator's La Salina 1, in the Las

George O. Ives, staff writer of The OIL WEEKLY, is now making his second tour of the oil fields of Venezuela, Colombia and Trinidad, gathering data and material for future articles on the oil operations in these countries. Ives first visited the countries about a year ago to bring the readers of The OIL WEEKLY latest information concerning trends in the development and exploration for oil in South America's principal producing nations. This is the first of a series of articles written on his current tour.

George O. Ives



Gasoline drums ready for shipment by barge to ports along the Magdalena River

Monas area, Middle Valley, had shows of oil and is setting casing at 3200 feet before drilling to projected depth of 4300 feet. The firm has another wildcat drilling on the Cantagallo concession, where it already has several producers, the wildcat being some 15 kilometers southwest of production.

Colombian Gulf Oil Company, most recent addition to the list of wildcatters, has started drilling Sardinata 1, and recently spudded Zahino 1 on an adjoining concession just southwest of Tropical's De Mares property. It has been reported that Gulf will move in yet another rig for a second test on the Zahino concession.

Richmond Petroleum Company is currently drilling the deepest well yet drilled in Colombia. Caraballo 1 in the Lower Valley, southeast of Barranquilla, is drilling below 11,494 feet, surpassing the depth of 10,929 feet to which Shell drilled Puerto Parra 1 on the San Juan concession in early 1941. In addition, it has two wildcats going in the Upper Valley, one of which, Chorrea Manteca 4, is preparing to test some sands found between about 5611 feet and 6795 feet where it landed a string of 4¾-inch casing. Total depth of this well is 7046 feet, where it has drilled into basement granite.

Despite the sharp increase in exploratory drilling, the only places expected to see any great volume of drilling activity are the producing concessions, particularly Shell's Casabe field on the Yondo concession, where the field is about defined and rapid development is needed to build up producing capacity. On the Barco four rigs are running, two of which are busy on deep outpost wells, and two on the shallower, Tertiary zone wells. One of the deep wells, Colombian Petroleum Company's 21-K, has drilled to 10,555 feet, set casing at bottom, but has now drilled out of the casing with intention of going to basement before coming back in an effort to make a well.

Acreage held under firm commitment by the various companies shows an increase of 5.5 percent over a year ago. While most companies have added to their holdings, two of them, Gulf and Richmond, have shown a net loss during the year. Gulf held 184,577 hectares a year ago, but during the year released two blocks totaling 95,625 hectares and now only has 88,982 hectares under firm commitment. It has applications for several concessions which have not yet been acted upon. Richmond Petroleum Company dropped 109,197 hectares since a year ago and now holds 88,572 hectares.

Fifteen Geophysical Crews

Geophysical activity has not increased during the year, but most companies are working seismograph crews in various parts of the country, and all have made application for additional concessions.

The Texas Company has five crews in the country, of which three are company crews and two contracted crews. Petty Geophysical Company has been working a crew for Texas for some time, but its contract is now up. Hoard Exploration Company is working for the company in the Department of Bolivar.

Shell is operating three crews—one company outfit and two United Geophysical Company crews.

Tropical has two crews working, one of which belongs to an affiliate of the company, and one of which is a Seismograph Service Company crew.

Phillips Petroleum Company, which has established itself in Colombia as Phillips Colombian Oil Company, is operating a company crew in the Middle Magdalena River area, just west of the river, having moved the crew in the first of July. This company has not yet moved in drilling equipment, since it is not anticipated that its concession applications will be finally acted upon for another 1½ to two years. Meanwhile, it is building an organization and doing detailed shooting work.

Colombian Gulf is operating a Seismograph Service Company crew in the Middle Valley, and Socony-Vacuum has one company party left in the country. It released one contract crew during the year and now has a Geophysical Service, Inc., party working under contract.

At least one other company, which has not yet acquired acreage in Colombia, has a geological party working in the Department of Bolivar, somewhere near Cartagena.

Geophysical work in this country is very expensive, varying greatly with the localities, but it has been estimated that to keep a crew operating costs from $50,000 a month upward, or roughly four to five times the cost of similar operations in the U. S. However, it has been relied upon to a considerable extent in recently programmed exploratory drilling. Early wildcatting in this country, as in most new areas, was largely on the strength of regional and local surface geology and other indications such as seepages, etc., but the major portion of the new work is on the basis of interpretation of geophysical work, mostly reflection seismograph, although there has also been some refraction work here.

Europe's
LAGGING PRODUCTION

By WILLIAN N. SMALL, Industry Analysis Staff
Office of International Trade, Department of Commerce

WHILE world production of crude was vaulting to new highs during the past two years, European output dropped well below 1938 levels.

Lowered output resulting from war damage and disturbance in the Soviet Union and Roumania far more than offset the gains in Austria and Hungary which had brought those countries in 1944 to the peak output of their brief producing history. Much reconstruction and repair, large quantities of supplies and equipment, and greatly increased drilling will be necessary before Europe can regain its prewar level of production.

For decades, the U.S.S.R. has been by far the leading European producer of crude petroleum. Roumania, with a fraction of the Soviet Union's output, has led the remaining European countries by a very wide margin. Austria, Hungary, and Germany fall next in line, but in none of these three has crude production ever amounted to as much as 1/20 of the European total.

Five countries — Russia, Roumania, Austria, Hungary, and Albania—at full production, could supply their own petroleum needs and perhaps export certain quantities. In no other European country does indigenous production cover more than a small part of requirements.

During the war, production figures emanating from Europe were meager and none too reliable. There has been a dearth of official statistics from the Soviet Union, and present reports from other countries—for example, Austria, Hungary, and Albania—also are limited as to facts and figures. Statistics cited in this report for countries other than Roumania, the Netherlands, and Italy have been derived largely from British trade publications, which consistently report in metric tons instead of barrels. Weight of crudes varies widely, but seven barrels to the metric ton gives a rough approximation. These figures may show considerable variation from United States trade estimates. In this article, the producing countries are discussed in the order of their importance as producers.

Soviet Union

The Soviet Union is the world's third largest producer of crude, being surpassed only by the United States and Venezuela. The new Five-Year Plan calls for an increase in Russian crude-oil output to 35,400,000 metric tons in 1950, and a target of 60 million tons a year has been set by Premier Stalin as an ultimate aim. Production in recent years is unknown, because of disruptions caused by the war. A definitive figure, recently cited by Premier Stalin, put 1940 output at 31 million tons.

The tendency has been to credit the U.S.S.R. with output considerably in excess of 31 million tons in the past two or three years. Recent reports from the Soviet Union, however, reveal that 3000 wells, having an annual yield of 5 million tons, were destroyed (either by the Germans, or by the Russians themselves as part of the scorched-earth policy) at Krasnodar (Maikop) and Grozny. Repair of such damage requires years. In the Baku area, which produced almost ¾ of Russia's oil, shortages of equipment and supplies cut production for long periods. In view of this, and considering the conservative figure set for 1950, it appears that output must have dropped sharply during the war years, inasmuch as exploitation of new areas did not make up the deficit. British trade estimates set U.S.S.R. petroleum output at 23 million metric tons and 25 million tons for 1944 and 1945, respectively. Very recent estimates by American observers place output in those two years considerably lower—18 million tons for 1944, and 20 million tons for 1945.

Output is expected to show a substantial increase in 1946, according to the Russian press. Refineries are resuming prewar standards for petroleum products. In the eastern part of the U.S.S.R. two large, well-equipped oil refineries have been put into operation, and extensive industrial construction is planned in the East by the oil industry.

Confirmation of the existence of oil in the Devonian strata was one of the major achievements of the Soviet oil industry in 1945, it is stated. Devonian oil has been found in the Samara Bend (Kuibyshev), in Tuimazy (western Bashkiria), Severokamsk on the Kama River, and Shugurovo in the Tatar A.S.S.R., and intensive development in these areas is expected in the next few years.

Wildcatting has almost doubled in the Baku region, it is reported, and at Buzovny in that area a new oil field is being put into operation. In a new oil field at Tash-Kala in the Grozny area, three flowing wells with a daily output of from 150 to 200 metric tons are in production. In the oil fields of the Dagestan, Grozny, and Krasnodar areas, damaged or ruined during the war, it will take some time to attain the prewar level of production.

Oil well drilling in 1945 was more than double that of 1944. Particular attention was paid to efficient operation and to more thorough exploitation of old fields.

Roumania

Crude production in Roumania — which before the war was the world's

Crude Output in Principal European Producing Countries, 1938 and 1944-45

COUNTRY	1938		1944		1945	
	Metric Tons	Barrels	Metric Tons	Barrels	Metric Tons	Barrels
U. S. S. R.	[1]29,700,000	207,900,000	[1]23,000,000	161,000,000	[1]25,000,000	175,000,000
Roumania	6,610,000	46,270,000	3,507,000	24,549,000	4,640,000	32,480,000
Hungary	33,000	231,000	850,000	5,950,000	654,000	4,578,000
Austria	57,000	399,000	1,210,000	8,470,000	[1]550,000	3,850,000
Germany	552,000	3,864,000	710,000	4,970,000	[1]500,000	3,500,000
Poland	507,000	3,549,000	350,000	2,450,000	[2]100,000	700,000
Other Countries	230,000	1,610,000	285,000	1,995,000	245,000	1,715,000
Total	37,689,000	263,823,000	29,912,000	209,384,000	31,689,000	221,823,000

[1] Estimated. [2] Estimated by writer.
Note: In reducing metric tons to barrels, the ratio of seven barrels to one ton was used.

sixth largest oil-producing country—was estimated at 4,640,000 metric tons in 1945. It is estimated that 1946 production will be about 4,300,000 tons.

The 1945 figure was a considerable improvement over 1944, when war damage held output down to 3,507,000 tons, but was substantially less than the 5,600,000 tons averaged in the years 1941-43, and only slightly more than half the record production of 8,700,000 tons attained in 1936.

The daily rate of crude production during 1945 increased from 12,000 tons in January to a peak of 13,400 tons in August, but declined thereafter, and in December the rate was only 12,100 tons, partly because of inclement weather. In view of greatly reduced drilling, however, production held up surprisingly well, and this was attributed to deepening old wells relatively short distances, and plugging back to perforate higher sands.

Drilling amounted to approximately 160,000 meters (524,400 feet) during 1945, roughly half the average of prewar years. A peak of 21,200 meters (69,536 feet) was reached in July, but in December the rate had dropped to less than 10,000 meters (32,800 feet). Shortage of equipment and the inadequacy of transportation facilities were primarily responsible for the reduced drilling program. No attempt was made to replace the 50,000 tons of tubular goods removed by the Russians in 1944.

Unless imports of equipment during 1946 exceed expectations, it is thought that not more than 100,000 meters (328,000 feet) will be drilled this year. Even if equipment becomes available, drilling will be restricted by the lack of proved drilling locations.

Little exploration was accomplished in 1945. No discoveries were made, and no important extensions or deeper sands were found. Shortage of equipment and transport, and the granting of preferential rights in exploration to the newly formed Soviet-Roumanian Petroleum Company contributed to the pessimistic outlook. The government failed to consider requests made by other oil companies for exploration properties.

Refineries Rebuilt

Refining capacity, more than sufficient to handle the lower crude production, was rebuilt in 1945. Straight-run apparatus was repaired first, and before the end of the year enough cracking capacity had been installed to handle the production. Lubricating-oil plants were not rebuilt in full, particularly those capable of producing relatively high-grade products. No work was done on the alkylation plant at the Astra Romana refinery which had been practically completed by the Germans.

Only 1½ million tons of the oil output was allotted for domestic consumption and exports to countries other than the U. S. S. R. were very limited—amounting to 3334 tons, according to preliminary figures.

Austria

Austria started production of crude oil just before the war. Increase was rapid and when output reached 1,210,000 metric tons in 1944, Austria became Europe's third largest producer. During 1945, under the impact of fighting and bombing, production declined sharply—a figure of 550,000 metric tons is estimated by one source.

According to an Austrian report recently cited in the European press, crude is now being produced not only in the Zistersdorf area proper, but also at Hohenruppersdorf, ten miles southwest of Zistersdorf, and at Muehlberg, between Zistersdorf and the Czechoslovakian border. Present output is said to be 40,000 tons monthly at Zistersdorf and 60,000 tons monthly at Muehlberg. This would indicate an oil production equal to that of 1944. Other oil deposits, it is stated, are being investigated in the environs of Vienna, in the vicinity of Graz, in Styria, and at other places in the foothills of the Alps. The Soviet Union is receiving the bulk of Austria's oil.

Hungary

Hungary's principal oil fields, at Budafapuszta, near Lispe in the southwestern part of the country, were discovered and developed by a subsidiary of a United States company. Production increased from 1366 metric tons in 1937 to almost 250,000 tons in 1940. When the United States entered the war in 1941, the Hungarian government took over the property, and under German pressure, development increased rapidly until in 1943 and 1944 output of more than 800,000 tons a year was attained. This production boosted Hungary into fourth place as a European producer. Besides the Lispe production, there has been a small output in the government field at Bukkszek in northeastern Hungary.

Wells, oil field installations, and the pipe lines from the fields to the principal refineries at Budapest and Almasfuzito were not greatly damaged during the fighting. The refineries suffered from air attacks, but all except one are now in operation again, it is reported.

Oil production declined to an estimated 650,000 metric tons in 1945, a figure well in excess of the country's normal requirements. Production in the Lispe fields has been under Russian supervision since February, 1945, and it has been charged that there has been considerable gas wastage from a number of wells, contrary to the most efficient oil-producing and conservation practices. In the absence of actual disposal figures, it is probably safe to assume that much of Hungary's present oil production is going to the use of the Soviet Union.

The future prospects and output of crude in Hungary cannot well be gauged until more information is forthcoming from the oil fields. Nationalization of oil production has been decided upon, according to recent reports.

Germany

Germany has produced limited quantities of crude oil for many years. In the attempt to increase production, intensive prospecting was instituted in 1933. As a result, a number of new fields were discovered, most of them not far from the old producing districts of Hanover, and crude-oil output rose from 230,000 metric tons in 1932 to 550,000 tons in 1938. A temporary increase to perhaps 1 million tons is believed to have been registered in 1940, but the gain could not be maintained, and in 1943 and 1944 production declined to about 700,000 tons. These figures, of course, do not include Germany's synthetic-oil production, which was in much greater quantity.

In 1945, output was estimated at ½ million tons. It was reported that in November, 1945, oil fields in the British zone of Germany, where the bulk of Germany's crude is obtained, produced more than 50,000 tons. This exceeds the prewar rate of production, but is considerably below the wartime maximum. To maintain this rate for any sustained period, continuous drilling will be necessary.

Poland

Poland, before the war, produced more than ½ million metric tons of crude annually, but output dropped gradually during the war years to only 350,000 tons in 1944. Poland's principal oil-producing areas, Boryslav-Drohobych, in eastern Galicia, were in the territory ceded to the Soviet Union. The oil fields left to Poland included only 30 percent of former producing wells, and production of these wells before the war amounted to about 120,000 metric tons a year. Production in the latter part of 1945 averaged slightly more than 9000 tons a month. Output during 1946 is not expected to exceed 120,000 tons.

Albania

Under Italian rule, it is believed that Albanian production of crude at one time touched 200,000 metric tons annually. Production dropped off in the later years of the war, however, and was estimated at not much more than 100,000 tons in the past two years. Albanian production is now state-controlled, and

■ CONTINUED ON PAGE 24

France's Exploration Program Broadened

PECHELBRONN in Alsace, about 30 miles north of Strasbourg, remains France's principal source of oil. Before the war, Pechelbronn average approximately 45,000 barrels per month. During February, 1946, its output was 27,000 barrels and in March the production rose to 33,500 barrels, or almost 75 percent of its prewar average. Half the production in the field comes from wells and the other half through tunnels dug into the sand bed.

Most of the oil activities and exploration work is in southwestern France, north of the Pyrenees in what is called the region of the Little Pyrenees, and from there extends north and west toward Bordeaux and the Atlantic Ocean in what is known geologically as the Aquitaine Basin.

The discovery well in the southwestern area was spudded September 2, 1938, and was located on the Saint-Marcet Anticline at a point nine miles north of the town of St. Gaudens. The well was completed January 20, 1939, at a total depth of 6365 feet for 150 barrels of oil and 6½ million cubic feet of gas daily. However, production went dead after four days and among the additional wells drilled in the area only one other test found an oil pay which did not produce commercially. The producing pay was the Jurassic Dolomite and the beds were very steeply folded.

St. Marcet Dome

Figure 1 shows the St. Marcet dome surrounded by four other domes, all within the concession area of the Regie Autonome des Petroles. Four of these domes occur along a main anticlinal fold. Twelve wells have been drilled at St. Marcet, two of which were dry. One of the wells is producing some 20 barrels of light oil daily and has recovered about 7500 barrels of oil. The oil is refined at nearby Frontignan. Two other domes east of St. Marcet and on the same anticlinal dome have two gas wells each. To the north of the Aurignac dome, two wildcat tests were failures.

Petroleum magazine, published in London, reported in its June, 1946, issue additional drilling by the Regie Autonome des Petroles at Puymaurin (between Boulogne-sur-Gesse and Lomez), Saint-Martory, Aurignac, Saint-Marcet, and Richou.

The Societe Nationale des Petroles du Languedoc has some deep tests at Gardiole and Saint-Dionisy and plans a test at Quissac. (See *World Oil Atlas* map for these concessions on the Mediterranean coast.)

The Aquitaine National Company is drilling two wildcat tests between Dax and St. Marcet in the vicinity of Donzacq. These are on geophysical prospects and their progress is being followed with great interest. Salt domes are present on the southwestern coast of France but their limited exploration has not resulted in the discovery of commercial oil.

France's Refineries

France had 18 refineries before the war, with an annual average capacity of 50 million barrels. A summary of salient data on these refineries will be found on Page 177 of the *World Oil Atlas*.

Only three refineries survived the war, with a combined output of 10 million barrels. Through joint cooperation, France began assembling and rebuilding refineries with startling speed and eight are now in operation with an output of only 17 million barrels a year. This output is steadily on the increase. During April, the output of 2½ million barrels was double that of the previous month. By 1955, France expects to reach a 75-million-barrel capacity or an increase of 50 percent of its prewar capacity.

Nation's oil activity is still concentrated on Little Pyrenees area where strike was made early in 1939

Marketing Agency

The "Pool des Carburants" is somewhat a unique organization which not only handles all the imports of oil and oil products but also acts as a clearing house for all sales and costs and tries to utilize all available facilities of refining, transportation and distribution. The Pool was born in August, 1940, and was supposed to be dissolved six months after the Armistice. However, so well has it fulfilled its purpose that it will continue for quite some time. An excellent account of the organization and accomplishments of the Pool des Carburants is given by Pierre Pezen in the May, 1946, issue of the *Industrie du Petrole et ses Applications*, published in Paris, under the editoriship of Olivier Lesourd.

The Pool is not a government organization, though it was created under the auspices of the government's "Direction des Carburants" and operates in close relationship with the groupement d'Achat des Carburants" (G.A.C.). The latter is the government's purchasing agency which receives all oil and oil products imports through the Societe d'Importation des Petroles et Derives (S.I.P.D.).

The Pool acts as an independent organization, responsible only to the participating companies which are the leading refinery and marketing companies in France. The purpose of the Pool is two-fold:

First, to distribute to the various oil companies the industrial and commercial facilities available in the country and all new equipment imported as well as to distribute equitably all imports of crude, lubricants, butane, paraffin and other oil products.

Second, to act as a clearing-house for all payments, receipts and costs of the participating oil companies, refineries and marketing organizations.

All storage facilities, such as tank farms, gasoline stations and retail stores; and all means of transportation, including oil and gasoline trucks, tank cars,

BAKER Triplex CEMENTING SHOE

down strap around the basket, allowing the basket to expand outwardly against the wall of the hole. The cementing operation is then carried out in the conventional manner with all cement slurry directed upward and *held above the shoe* by the expanded Baker Metal Petal Basket.

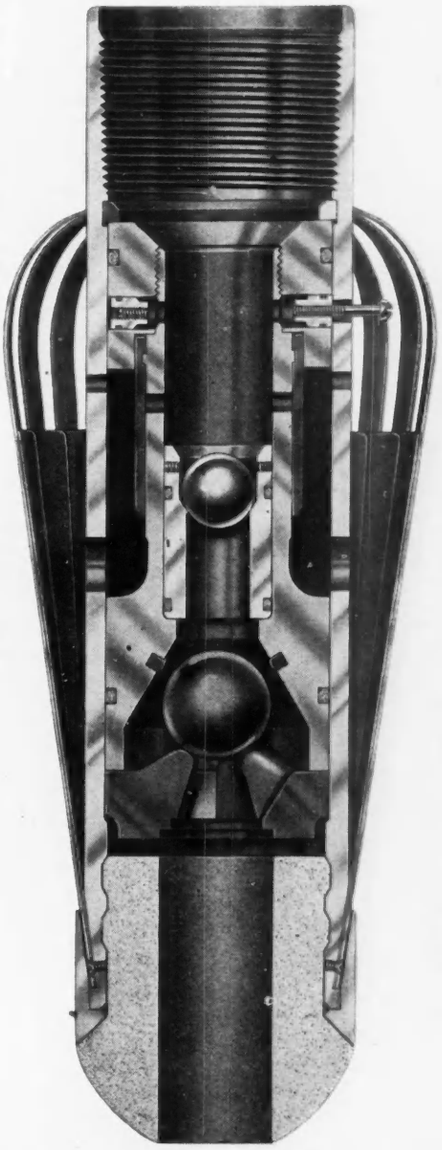
The Baker TRIPLEX Cementing Shoe consists of a whirler float shoe with a Baker Metal Petal Basket fastened on the shoe below the cementing ports. All cement slurry is directed upward and retained above the shoe. A fabric reinforced, resilient rubber, sleeve-type back-pressure valve opens readily to permit passage of the slurry into the annulus above the shoe, but closes instantly to prevent any return flow of slurry.

All internal parts are made of readily drillable materials. Two one-half inch set screws hold the inner assembly stationary to facilitate drilling out the shoe.

EASY TO ORDER AND USE

When ordering the Baker TRIPLEX Cementing Shoe it is necessary to give only the size, weight and thread specifications of the casing upon which it is to be run. It is advisable to furnish hole size, because (a) the TRIPLEX Shoe is approximately ½" larger than the O.D. of a standard casing coupling; and (b) the Metal Petal Basket must be of sufficient size to expand and pack-off even in large diameter and irregularly shaped holes.

The use of a Baker TRIPLEX Cementing Shoe is no problem to experienced cementers. Its effectiveness is evident from the demand from all active fields. Contact your nearest Baker office or representative.



After safely floating in the casing and moving it freely to condition the hole, the tripping ball is gravitated or pumped down, seating on top of the tripping valve. Pressure of 400 to 500 psi then shears the screws in the tripping valve which moves down and exposes the whirler cementing ports. Shearing the screws also releases the Baker Metal Petal Basket which expands against the side-walls and forms a bridge. Or, if the hole is irregular in shape, the Basket packs-off to fill the annular space and hold the cement slurry above the shoe.

BAKER OIL TOOLS, INC.

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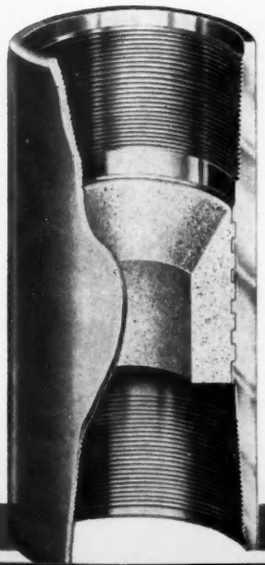
"There's a Baker Man in Your Territory"



THE TRIPLEX CEMENT BAFFLE COLLAR
(PRODUCT NO. 137)

It is obvious that a *regular* Baker Cement Float Collar cannot be run above the Triplex Cementing Shoe as it would prohibit the passage of the Tripping Ball which actuates the Shoe.

The Triplex Cement Baffle Collar (Product No. 137) therefore is recommended to provide these important advantages:

(a) to serve as a stop for the conventional cementing plug;
(b) to insure that any mud-contaminated cement is left inside of the casing.

Care should be taken to run the Triplex Cement Baffle Collar *with the beveled end of the concrete plug up,* to facilitate the passage of the Tripping Ball.

CONSTRUCTION DETAILS

The Triplex Cement Baffle Collar consists of a seamless steel coupling in which is cast a baffle, or plug, of Baker-Formula Concrete with a centered hole having an I.D. sufficient to pass the Tripping Ball which is dropped from the surface to operate the Triplex Cementing Shoe. The top of the concrete baffle is beveled to provide a conical entrance to the hole to facilitate the passage of the Tripping Ball.

This unit is furnished with "Double Female" or "Male and Female" threaded connections. When ordering give size, weight and thread specifications of the casing.

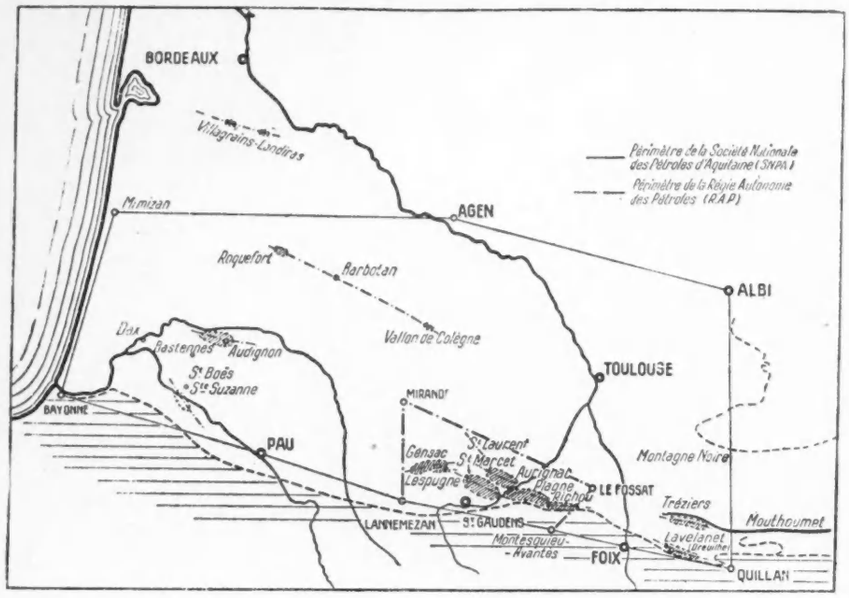


Figure 1. Location of structures in the d'Aquitaine Basin area of southwestern France which is being actively prospected for oil.

(Reprint from Science et Vie.)

packing, loading and other shipping facilities, are made available to the Pool, whose duty it is to utilize these facilities to the common interest of the French oil industry. The Pool operates under a committee in which each participating organization has its own delegate. It has accomplished not only a great saving of unnecessary marketing costs, but has assured even deliveries of oil products throughout the entire nation at a time when imports and refining facilities were limited and none too dependable; and it has materially helped in the rehabilitation of the oil industry, as was illustrated by the rapid improvement of the refineries. Ownership of stocks or equipment is retained at all times by the individual company and the Pool acts only as its agent and as a clearing-house.

Imports Heavy

Because of France's limited oil production she has to depend largely on import to replenish her domestic needs. Before the war, France imported about 60 million barrels of oil annually. France had interests in the Iraq Petroleum Companies and in several companies operating in Roumania, the most important of which was the Colombia Company.

During the war France, of course, has not received its share of oil from Iraq, which from 1940 to 1945 amounted to 117 million barrels. She has lost all her interests in Roumania which were confiscated by the Russians under pretext that it was German property since the Germans had confiscated it during their conquest of Europe. No oil is imported from Roumania because all of the oil is committed to Russia under the armistice terms. At present France imports most of her oil from the United States, South America and the Middle East. During March, 1946, France received 198,500 tons (1,450,000 barrels) of crude and 120,000 tons (875,000 barrels) of refined products.

Import Regulation

Imports for 1946, announced by the French Government, are to be made to the account of the Groupement d'Achat des Carburants only from such countries as have concluded monetary agreements with France. The schedule provides for purchases amounting to $23,460,516 for civilian needs and $7,823,850 for military needs, these purchases to be made in the dollar exchange countries, and 11,350 pounds in the sterling exchange countries.

In addition, France needs drilling and refining equipment, most of which will be purchased in the United States. Her rotaries and equipment are old and unsuitable for the present hard rock drilling in the south of France. During the war the drilling of wells was slow because of failures of tool joints manufactured in France. France manufactured her own casing and tubing, which proved satisfactory, but somehow the tool joints would fail. This condition is being remedied and France is in the market for American equipment, not only because of its high quality and stamina under difficult working conditions, but also because of the credits extended by the United States which make these purchases possible.

Europe's Production

■ CONTINUED FROM PAGE 19

is sufficient to meet the country's needs and to allow some exports to Yugoslavia.

Other Countries

From 1939 until the end of 1945, about 400,000 tons of crude were produced in England, largely from three small fields in Nottinghamshire. The peak was in 1943, when more than 100,000 tons were obtained. Since then, output has declined, and at the end of 1945 was running at the rate of some 70,000 tons per year. Unless new discoveries are made, output will continue to dwindle.

France has engaged in exploratory work in the southern part of the country since 1939, but with unspectacular results. As before the war, France's commercial output of crude comes from the Pechelbronn fields in Alsace. Under German control, production was stepped up somewhat above the prewar 75,000 tons per year, but damage to installations caused output to drop later. Toward the end of 1945 output was at approximately ¾ the prewar rate.

It is reported that Czechoslovakia's small crude output was increased to about 30,000 metric tons annually during the war, but no report of the magnitude of present operations is available. The oil deposits exploited are considered to be an extension of the oil-bearing area which is considerably more productive in Austria.

Italian crude output, most of which is in the Po Valley, was shrinking before the war, amounting in 1938 to less than 15,000 metric tons annually—not even 1 percent of the country's requirements. Output during the war apparently showed little if any increase, and present production is reported to be at the rate of not much more than 1000 tons a month.

The Germans made a discovery at Coevorden in Drente in the Netherlands during the occupation, and under development by the Dutch, production is stated to be about 1200 metric tons a month.

Oil deposits giving relatively small yields are reported to have been discovered in Yugoslavia adjacent to Hungary's principal oil fields, but no figures are available. Production in other European countries is negligible.

Prospects Not Bright

At present, the prospect of any great increase in Europe's production, outside of the Soviet Union, is not too bright. Austria and Hungary would seem to hold the best promise, but continued prospecting and exploration may yet uncover new deposits of oil in other countries. Meanwhile, even to maintain present output, intensive drilling and new and replacement equipment are needed.

River crossing on the new Saratov-Moscow gas pipe line.

A Soviet oil operation on Cape Nordwick in the Arctic region

Russia's

OIL PROJECTS IN EASTERN AREAS

RUSSIA plans a considerable production increase in the eastern part of her territory with rapid rehabilitation of the industry in the Caucasus—Baku, Grozny and Krasnodar—according to a statement of policy appearing in a special bulletin on the "Fourth Five-Year Plan," issued by the Soviet Embassy Information Section at Washington.

The Russian oil industry must be quickly restored and developed, says the bulletin, "so that prewar levels of extraction and refining are reached in 1949 and exceeded in 1950." Maximum development is scheduled for the Eastern regions—in the Urals, Bashkir ASSR, the Volga Basin, on Sakhalin Island, in the Turkmenian SSR, as well as in the Ukranian SSR.

The bulletin says: "Geological surveying and the preparatory work on new oil fields shall be developed to insure the fulfillment of the indicated increase of output, and to have completed surveying by 1950 of commercial reserves sufficient for no less than two to three years ahead. Provisions shall be made for greater survey drilling and for increasing its share in the total drilling done."

The Russians announce that they plan to extend high-speed methods of sinking wells by rotary drilling, while deep wells using pumps will be provided with improved equipment, and secondary exploitation methods will be introduced. "Hermetic equipment shall be employed in the extraction, collection and transmission of petroleum."

The bulletin adds: "The production of high-octane aviation gasoline shall be developed, and the quality of gasoline for motors, kerosine for tractors, oil for diesel engines and lubricating oils improved. The quantity of oil products obtained from petroleum must be increased by reducing losses and introducing catalytic and other up-to-date methods of producing gasoline and industrial oils."

Plants Planned

During the five-year period, four oil-refining plants and 16 oil-refining installations are to be built, it is announced. Three oil refineries shall be rehabilitated to supply products to the agricultural and industrial regions of the south part of Russia. New oil pipe lines are to be built, and the output of gas-black and lamp-black is to be extended into a large-scale industry by plant enlargement.

"The production of oil machinery, equipment and measuring instruments shall be rehabilitated and greatly extended so as to meet the needs of the oil industry in full."

By 1950, the announcement says, the output of gas from coal and shale shall be increased to 1,900,000,000 cubic meters (about 67 billion cubic feet) and of natural gas to 8,400,000,000 cubic meters (about 295 billion cubic feet). Work on the underground gassification of coal is to continue so as to attain an output of 920 million cubic meters (about 32 billion cubic feet) a year by this method by 1950. "Industrial enterprises for the conversion of coal and shale into liquid fuel shall be started. By 1950 the output of liquid fuel from coal and shale is to reach 900,000 tons (about 6,300,000 barrels).

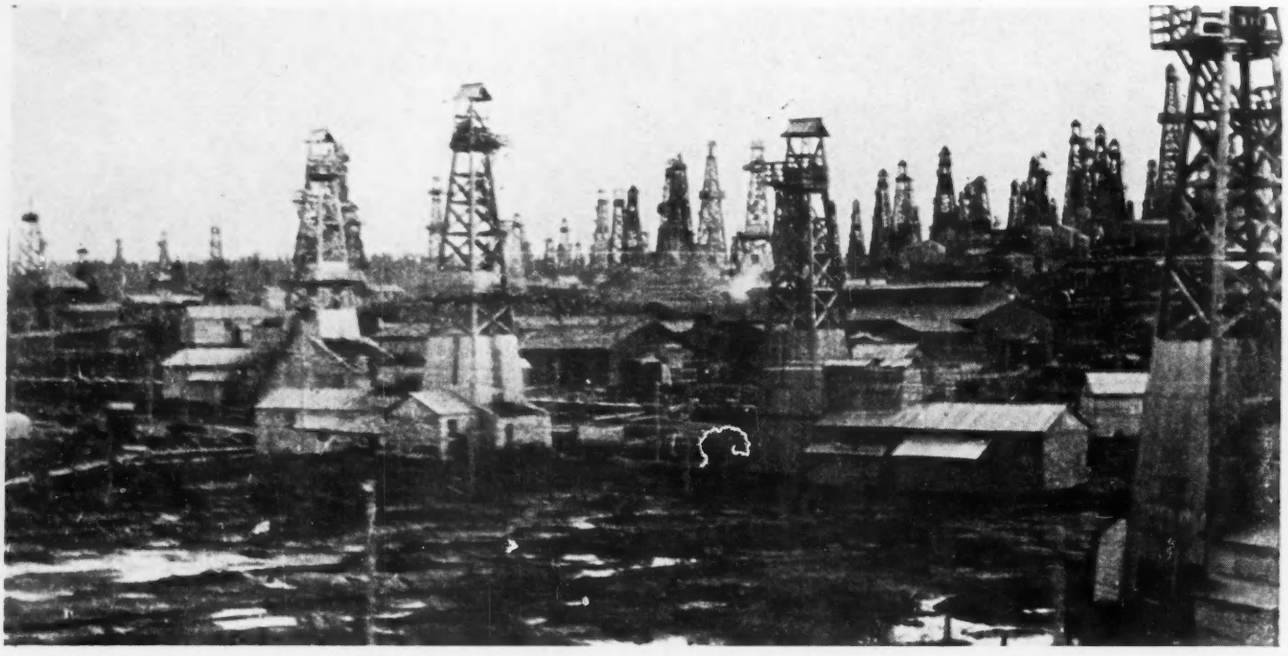
Shale mines with a capacity of 9,400,000 tons (about 65,800,000 barrels) in the Estonian SSR and of 3 million tons (about 27 million barrels) in the Leningrad region shall be rehabilitated or newly built "for the purpose of starting an industry for the manufacture of gas from shale." Two plants for the hydration of coal and one for the production of synthetic petrol shall be built.

Oil production under the new Five-Year Plan is slated for 14 percent expansion over the prewar level, reaching 35,400,000 tons (about 254,880,000 barrels) annually, A. Mikhailov and M. Dmitriev declare in an article entitled "Increases Planned in Oil Production During the Next Five Years" in the information bulletin issued by the Soviet Embassy.

Those two writers (not otherwise identified) said the plan accents development of oil resources in the eastern regions of the Soviet Union, which are to provide 36 percent of the country's total output in 1950 as compared with their prewar production of 12 percent.

The oil fields of Baku yield more petroleum than all the other oil fields in the Soviet Union taken together, the writers cited.

"Before the Revolution there was no



General view of an oil field on Sakhalin Island where maximum development is planned by the Soviet Union under the new Five-Year Plan.

—Pictures by Sovfoto

geological chart of the Baku area. Wanton exploitation killed important deposits when water was allowed to flood the lower oil bearing strata.

"Today the Apsheron Peninsula has been thoroughly studied, new deep oil sands have been tapped, and new fields have been opened. Extraction of oil from the sea bottom has been started, and what was Ilych Bay has been filled in and is covered with oil derricks."

In the course of the present Five-Year Plan, the Baku oil field is scheduled to increase its output by 50 percent.

The writers declared there is an abundance of oil in the "Second Baku" area—that area outlined by Kirov, Molotov, Chkalov, and Saratov lying between the Volga and the Urals.

"In 1929 oil was struck in Chusovaya, a small town in the Urals, and in 1932 exploitation was inaugurated at an oil deposit in Ishimbayevo, 93 miles south of Ufa, capital of Bashkiria.

"Soon afterward, rich oil deposits were discovered at Krasnokokamsk near Molotov, and near the city of Buguruslan, in the Syzran district, and in Samarskaya Luka. Oil was struck in Tuimazy and later in the Tatar districts. The output of oil began to increase year by year. More and more oil derricks began to arise in the 'Second Baku' square amid the forests and steppes.

"The vast territory which had always consumed oil had turned into a producer of oil.

"The output of oil in this area continued to increase during the war. It was then also that a very promising discovery was made. Geologists found oil in Devonian strata at a number of points between the Volga and Urals. These strata, lying at a great depth, are spread here over a vast territory. Now Devonian oil is already being extracted both in Bashkiria on the Volga and in the Molotov region.

Tuimazy Pipe Line

"The output of oil in Tuimazy this year will be triple that of 1945. Preparations are now in progress for the construction of an oil pipe line 93 miles long. Within a short space of time four new oil fields will be established in the Kuibyshev region, and two cracking plants built.

"An interesting method of turbine drilling is being used in Samarskaya Luka. Here the oil lies at a great depth under the mountains. The first wells were drilled from the mountain tops, but it was incredibly difficult to bring up equipment weighing many hundreds of tons. Now the drilling is done at the base of the mountain, not vertically, but on an incline at an angle of 30 degrees under the mountain. With such a method of work a whole fanlike cluster of wells can be drilled."

The writers also discussed the oil possibilities of Nebit-Dag, in the midst of the arid desert wastes of Kara-Kum in Turkmenistan.

"Prospecting work conducted by Soviet geologists has confirmed Academician Gubkin's prediction that Nebit-Dag would become a large and important oil field," they said.

"Nebit-Dag oil had attracted the attention of industrialists as far back as the nineteenth century. The first drilling was started in 1882, but none of the five wells sunk struck profitable strata, and the work was given up.

"It was taken up again in 1927, but again the test wells failed to come up to expectations. However, Soviet geologists persevered, and in 1931, well No. 12 came in a gusher.

"It has been established that the whole of the Caspian Basin in the eastern district of Turkmenistan is composed of oil-bearing sands, an area of 9650 square miles. Geologists have proved that some parts of this district have oil resources running into millions of tons.

"A great oil industry has grown up around Nebit-Dag, with power plants, compressor pumps and a city of 538,200 square feet of housing for the oil men, as well as clubs, libraries and other cultural facilities. Trees are being planted, and in 1941 Nebit-Dag received drinking water from its 83-mile pipe line.

"Great refineries have been built for Nebit-Dag oil and to turn out oil products. The number of wells increased from eight in 1933 to 146 in 1945, and the output jumped from 95 tons (684 barrels) a day to 1950 tons (about 14,000 barrels) daily.

"In spite of the considerable difficulties presented by the semi-arid region, the oil fields are being expanded, and eastern Turkmenistan is to become one of the largest oil centers of the Soviet Union in the course of the next few years."

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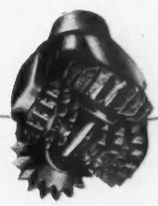
. . . for drilling the very hard and abrasive formations, such as chert, hard lime and the dense, abrasive sands.



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Mexico's Oil OUTLOOK

MIGUEL ALEMAN

UNDER Mexico's present governmental setup, the word of the president of the Republic can easily formulate a new petroleum policy or cancel an old one.

The president-elect of Mexico, Miguel Aleman, will take office December 1, 1946. He has yet to announce a definite policy with reference to oil. It is a foregone conclusion that he will have to take some drastic steps to provide Mexico with sufficient petroleum for her rapidly growing industries. All indications are that Mexico's industrialization program will expand year by year—and that means more and more petroleum will be required.

The President-elect is thoroughly cognizant of the situation. His experience as chief of the Federal Department of government, one of the most important posts in the cabinet, makes it inevitable that the shortages of gasoline, fuel oil and kerosine (in all of the cities and rural districts of Mexico at one time or another) have come to his attention. Although a lawyer by profession, his intimates always speak of the coming president as having the makings of a first-class economist. Therefore, he should not fail to see the necessity of doing something about the petroleum situation.

Pemex has not found any new fields of importance—and the reason is obviously that finding new fields costs money. Pemex is not making money, on the contrary it is losing money every day. It could not be otherwise, since all Pemex's expenses have gone up in the general inflation and yet petroleum products are selling for the same price they were sold for in 1937. From January, 1938, to the beginning of this year, Pemex's payments for wages and benefits to the petroleum workers rose from 44 million to 178 million pesos.

Mexico needs a network of pipe lines. The railroads cannot handle the distribution of petroleum products satisfactorily and it is extremely doubtful that any additional railroads will be built. Highways and airplane transportation are certain to be the arteries of commerce for future developments in Mexico—and that means more petroleum and better distribution.

Mexico needs new oil fields. And before building pipe lines from the existing fields, it would surely seem logical to look for new fields nearer the coming centers of industrialization. Especially when it can be foreseen that the existing fields cannot long continue to meet an expanding demand. Poza Rica alone supplied over 50 percent of Mexico's crude production in 1945. As the old fields continue to decline, Poza Rica's percentage of the total output will have to be raised from year to year and it is not difficult to see the danger of a situation wherein the whole country is dependent upon one field.

Not so long ago Mexico ranked No. 2 in the world's petroleum market, and many citizens hope Mexico can regain that position. Here again, the fact that the President-to-be is an able economist leads to the conclusion that he will unquestionably realize what annual exports of 100 or 200 million barrels of petroleum products per year would mean to the general economy of Mexico.

Does Mexico actually have enormous potential petroleum reserves? Time alone will have to prove whether she has or not but, for a quick picture of the "possibilities," the following figures in comparison with the neighboring state of Texas (whose geological formations march on down into Mexico) are offered. Texas has about 250,000 square miles of possible petroliferous area; Mexico has about 160,000 square miles in the same classification. Texas has produced 10 billion barrels of oil and Mexico has produced only 2 billion barrels of oil.

Just how these reserves will be developed is the big question. There are several contradictory factors which must be reconciled. To begin with, Mexico does not have the enormous capital necessary to carry out a full scale development of her petroleum reserves; and yet, the Mexican government and the Mexican people are firmly convinced that foreign capital shall never again be allowed to control any great natural resource of Mexico. On the other hand, the necessary capital, backed by the most expert petroleum technicians in the world, is available right next door in the U. S., but Mexico's oil expropriation of 1938 still rings a warning bell in the ears of the American investor.

This situation has given rise to speculation that American capital will again be invited to participate in the development of Mexico's resources. However, the several contradictory factors mentioned in the preceding paragraph must be reconciled. It may be considered that the following are factors which are likely to be incorporated in any proposition developed:

1. The Mexican government will control exploitation of Mexico's petroleum resources with a careful eye to Mexico's domestic demand and the conservation of reserves for the domestic demand of the future.

2. The Mexican government will demand a royalty on every barrel of oil produced.

3. Every possible effort will be made to keep control of the oil lands in the hands of Mexican companies or citizens.

4. Financial and technical assistance from the U. S. will be accepted on some sort of profit-sharing basis, without surrendering control of the oil lands to foreign capital.

5. Possibly by treaty or some form of agreements between the two governments, American investors will demand and receive some guarantee that their investments will be protected.

Needless to say, the initiative must lie with Mexico. Being cognizant of the situation, President-elect Aleman may offer a new petroleum policy in the hope of developing sufficient production to meet expanding consumption.

See page 33 of the regular section for later developments on Mexico's attitude toward foreign operators.

Roumania's Drilling Activities Slowed

THE average drilling in Roumania for the first quarter of 1946 was 37 percent below the 1945 average, recording a ten-year low of 27,500 feet per month. This drop was anticipated because of lack of drilling equipment and casing, a bog-down of the transportation system and lack of coal needed by the heavy industry and the railroads. The use of oil for fuel is greatly limited because of heavy commitments in oil to Russia under the Armistice conditions and in exchange for food. Daily production averaged 85,500 barrels a day for the first quarter of 1946, or a drop of 9 percent below the 1945 average of 93,000 barrels (THE OIL WEEKLY, June 3, 1946).

Tighter Control

Also, as anticipated, was the tightening up of governmental control of all activities of the Roumanian oil industry aimed primarily at making sure that the oil commitments to Russia will not be sidestepped. Thus, the *Monitorul Petrolului Romain* publishes the following decree-law of April 18, 1946, with the following excerpts:

"A Commission of Petroleum Coordination is hereby established as a division of the Department of Mines and Petroleum, in connection with the fulfilment of the obligations of the Armistice, having the following purposes:

"a. To gather all evidence of oil, gas and gasoline production.

"b. To distribute the crude oil and gasoline products to refineries and control the utilization of gases.

"c. To work monthly schedules of distribution of crude and gasoline products to refineries.

Drilling Activities in Roumania

YEAR	ANNUAL DRILLING Meters	ANNUAL DRILLING Feet	Av. Monthly Feet
1938	288,000	944,600	78,700
1939	256,000	839,700	70,000
1940	235,000	770,800	64,200
1941	252,900	829,500	69,100
1942	343,800	1,127,700	94,000
1943	341,500	1,120,100	93,300
1944	147,000	482,200	40,200
1945	160,000	524,800	43,700
1946:			
Jan.			28,500
Feb.			23,000
March			31,200

"d. To establish monthly schedules of end products to be delivered by the refineries.

"e. To follow up the execution of the established schedules by the refineries and to take such measures as are needed for the fulfillment of the delivery schedules."

All of the above are part of Article I and the balance of the decree-law is to be found on page 133 of the *Monitorul Petrolului Romain*, March-April, 1946. The last article of the above decree is quoted since it gives a background of the general trend of "Roumanian free enterprise," a topic of interest to the American oil industry which not only had substantial holdings in that country but also contributed very materially to the technical advancement of the Roumanian oil industry in prewar days:

"The Commission of Petr[illegible] Coordination will function until the obligation of delivery of oil to the U.S.S.R. has been fulfilled as per Article XI of the armistice terms."

In connection with the deliveries of oi lto U.S.S.R., it is interesting to note that the Russians built in 1945 a ten-inch pipe line from Faurei to Reni in the southwestern corner of Bessarabia, north of the Danube. The line is a branch-off from the old ten-inch carrier from Ploesti to Constantza. This pipe line to Reni has a reported capacity of slightly over 300,000 barrels per month. However, the shipments for the first quarter of 1946 were far below capacity, being as follows: January, 116,800; February, 131,400, and March, 153,300 barrels.

Among other laws recently passed by the Roumanian Congress are the ratification of the following agreements with the U.S.S.R. as of April 15, 1946:

a. Agreement for the establishment of a Soviet-Roumanian Company, to be known as Savrompetrol, for the exploration, exploitation, transportation and sale of crude and refined products as established on July 17, 1945 (for details see OIL WEEKLY, June 3, 1946).

b. Agreement for the establishment of a Soviet-Roumanian Aviation Company as established on August 8, 1945.

c. Agreement for the establishment of a Soviet-Roumanian Company of navigation as established on July 19, 1945.

d. Agreement for the establishment of a Soviet-Roumanian Bank as established on August 14, 1945.

Crude Production of Roumania for First Quarter of 1946*

MONTH	Tons	Barrels	Bbls./Day
January	365,000	2,664,500	86,000
February	326,000	2,379,800	85,000
March	363,000	2,649,900	85,500

* See The OIL WEEKLY of June 3, 1946, for past production data.

1946 Drilling and Production

At the close of 1945, Astra Romana Company (Royal Dutch Shell) was still leading in drilling and production, accounting for 22 percent of the 525,000 feet drilled and more than a third of the 33,872,000 barrels produced. Five companies, including the four companies that are not in the Savrompetrol (U.S.S.R.) group, namely, the Astra Romana, Romano-Americana (Standard Oil Company of New Jersey), Steaua Romana and Unirea account for almost ¾ the total drilling and production.

A ten-inch gas line is in project connecting the Transylvanian gas fields with Bucharest. Bucharest had already been served by natural gas from the Manesti-Vladeni gas field and from other oil and gas fields in the Ploesti area but this supply fell short of expectation.

Crude Production During 1945 by Companies

COMPANY	Tons	Barrels	Percent of of Total
Astra Romana (Shell)	1,572,043	11,476,000	33.9
Steaua Romana	443,163	3,235,000	9.6
Romano-Americana (Standard N.J.)	492,317	3,594,000	10.6
Unirea (Phoenix Oil & Trans.)	369,886	2,700,000	8.0
Sovrompetrol Group:			
Creditul Minier	253,590	1,851,000	5.4
Concordia	555,452	4,055,000	12.0
Redeventa	39,622	289,000	.8
Colombia	338,685	2,472,000	7.3
I.R.D.P.	83,020	606,000	1.8
Others	492,222	3,594,000	10.6
Total	4,640,000	33,872,000	100.0

Oil Companies May Get Into Squeeze At October Elections in Venezuela

The forthcoming general elections in Venezuela, scheduled for October 9, may be used as a political squeeze on oil interests there. Registration of voters in Venezuela, which began July 5, was accompanied by several signs of an increasing arbitrary character of the national petroleum policy.

First, there is a growing rumor that the Venezuelan government will take the position that taxes on oil operations must be boosted in order to meet the new national budget. The revolutionary junta released its proposed budget July 10, calling for expenditures of 787,000,000 bolivars (about $236 million), largest budget in the history of Venezuela. It is chiefly slated for education, public works and public health.

Some type of permanently higher tax is also indicated in the government's decree of last year clamping the extraordinary income levy on all businesses as of December 31, 1945. That surprise move was a 6 percent tax on all earnings in excess of 800,000 bolivars, but it ranged up to 20 percent on earnings of more than 2 million bolivars ($600,000). While this tax applied to all businesses and hence was not in principal discriminatory, actually it fell on only about 40 companies.

Tax Levy Status

At that time the provisional government gave categorical promises that it did not plan to reinstate this tax again in 1946. That promise could be used to argue the need for a permanent upward revision of income rates, since the government could contend that its promise to forego the extraordinary levy limited its sphere of action in special tax legislation. It is true, of course, that any oil company would rather bear a permanently higher tax that was a fixed, anticipated levy instead of being subject to extraordinary taxes imposable by mere decree.

With the elections of October, the revolutionary government which seized power in October, 1945, will withdraw, and under its declared program no member of the revolutionary junta can stand for office. The influence of the present president, Romulo Betancourt, however, is expected to carry far with the incoming administration. Candidates have not yet been announced, but it is expected that Romulo Gallegos will head the slate of the Accion Democratica which is known to have the help of the current junta.

The present government under Betancourt took power in the name of guaranteeing certain social "reforms," and it has been critized for slowness in achieving concrete results. A squeeze on petroleum interests would be one way of quieting resentment, using the familiar propaganda techniques of finding scapegoats in "foreign exploiters." This may be back of such statements as that recently made by Minister of Development Ja Perez Alfonso that some kind of an excess profits tax should be levied against oil companies operating in Venezuela.

"Outside Oil Interests"

Another indication of political maneuvering on the part of the junta was the recent report originating in Caracas that at least four U. S. independent operating groups have made bids to Venezuela for purchase of royalty oil. At least two of the interests named in Caracas dispatches denied at the home offices in the United States that they were even negotiating such programs. The opinion grows that the Venezuelan government has striven to leave the impression that new groups are seeking to displace, at least in part, the position of some major companies operating there. This playing off of major against independent is also an old procedure by governments pushing for every possible advantage. The David D. Feldman proposal is a case in point. First reports—which certainly had junta knowledge if not approval—indicated that the Feldman deal was virtually approved. Then the status of Feldman's negotiations became more fuzzy, and it was finally disclosed that the originally reported contract is still only a myth. It is being carried over to the new administration and hence may serve as a political weapon during the elections if the Venezuela politicians feel that it is advisable to beat the drums against the "big outside oil interests."

Creole's June Production Shows a Sharp Increase

Creole Petroleum Corporation during June enjoyed a sharp increase in production. The output averaged 570,040 barrels daily, including 420,152 barrels daily at Lake Maracaibo and Cumarebo in Western Venezuela, and 149,888 barrels daily in Eastern Venezuela. This compared with Creole's average daily flow of 445,722 barrels in both areas during the month of June, 1945.

During the month of June, 1946, the company completed 14 oil producers and one dry hole in Venezuela. Four oil wells were finaled at Mulata, 9 at Jusepin and one at San Joaquin.

At its Caripito refinery, the company refined an average of 52,504 barrels daily during the month and 9341 barrels daily at its La Salina plant.

Standard to Start Soon Exploring Bahama Waters

Petroleum scientists, equipped with a diving chamber and using radar to plot their positions, soon will launch a search for oil in the rock and sand beneath the surface of 2000 square miles of water in the northwestern Bahamas.

The exploration will be conducted by Standard Oil Company (Bahamas) Limited, a subsidiary of Standard Oil Company (New Jersey), in the shallow waters north of Grand Bahama Island. East of West Palm Beach, Florida, and separated from the mainland by the relatively deep water of the Florida straits, the site is in a section of the Atlantic Ocean where the water in most places is less than 20 feet deep.

The engineers will sink the diving chamber at various points in the area to map the ocean floor. The diving chamber will house an operator and a gravity meter, an instrument that measures the pull of gravity, furnishes indications of the type of rocks below the ocean bed and indirectly provides information as to the presence of oil. If geophysical reports are favorable, over-water rigs will be erected later for drilling tests.

On the surface, the use of radar will permit the geophysicists to plot the site of all tests with improved accuracy. Radar targets 50 feet high will be set up at strategic points in the exploration area.

A vessel formerly operated by the Canadian Navy in anti-submarine work, the 112-foot Stanba, is one of the first craft ever to be equipped with radar in the search for oil, company officials declared. The Stanba recently arrived at Nassau.

(See THE OIL WEEKLY June 3 for further data regarding exploration in the Bahamas.)

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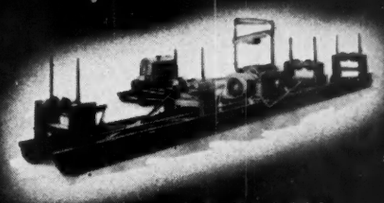

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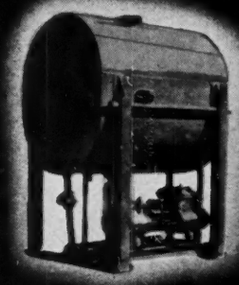

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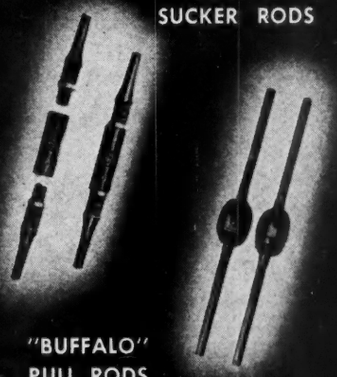

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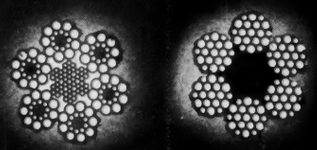

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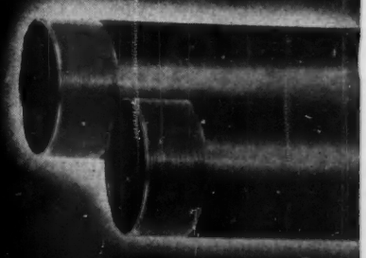

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European Rehabilitation by American Oil Companies Showing Some Progress

Political and economic uncertainties are holding up large capital expenditures by American oil companies in Eastern Europe for the rehabilitation of their war-disrupted properties. While the industry was prepared a year ago, right after the end of the war, to launch an extensive reconstruction program of fields and refining units, since that time the picture has become so clouded that it appears impossible to put rehabilitation work under way in Eastern Europe in the foreseeable future.

However, the American industry is proceeding rapidly with its reconstruction work in Western Europe. Standard Oil Company (New Jersey) has progressed far with the reconditioning of its Port Jerome plant on the Seine near Rouen, France. In its repair, the company reports it was especially fortunate in obtaining necessary authorizations from the French government. Few trade curbs were invoked despite the fact that Standard had to purchase most of its materials in the United States.

The Port Jerome refinery, with a daily average capacity of 25,300 barrels before the war, now is handling 12,000 barrels daily. Standard plans not only complete rehabilitation of this property, but elaborate expansion as well. Catalytic cracking equipment and thoroughgoing modernization are projected for 1950 completion.

Socony Held Back

Socony-Vacuum Oil Company, Inc., is not so far advanced with the rehabilitation of its Gravenchen plant, located next to the Port Jerome plant. Work is under way on this unit and on Socony's other refinery at Frontignan, each of which had about 4000-barrels a day average capacity prewar.

Many industry officials expect that France will become the refining center of all Western Europe, and the French government is moving along its prewar course of compelling processing operations within its own borders.

Britain is expected to sponsor the same type of program, and already Standard has plans under way for constructing a refinery in England. Many restrictions growing out of the sterling bloc are likely to be removed now that the British loan has been approved.

It is estimated that as much as a third of the $3.75 billion credit will be spent in the United States in the next five years. Britain announced July 5 that any American manufacturer will be able to export to Britain up to 20 percent by value of his average yearly shipments during the years 1936-1938.

Of the projected $650 million loan to France, two thirds of it would go toward financing the purchase of new industrial equipment and one third toward the purchase of raw materials. In the total is earmarked a $50 million item for the purchase of "solid and liquid fuels."

What of Russia?

Thus, while in Western Europe and the British trade area, the long-awaited lifting of economic barriers is under way, the situation in Eastern Europe is more discouraging than ever. The chief doubt concerns the aims of Russia and her unrelaxing policy of domination and exploitation of Roumania, Austria and Hungary.

In the face of the continuing Russian policy, all American industry is holding up any expenditure in area of Russian influence.

Zistersdorf Output

Official reports from Vienna say that the daily oil production of the Zistersdorf area now amounts to an average of 4000 tons (27,100 barrels). If maintained at this rate for the next 12 months, the annual production will near the 1½-million-ton mark (about 10 million barrels), well above the peak figures reached under German exploitation.

Bulgaria Prospect

Bulgaria will purchase from Sweden a drilling unit capable of drilling to 5200 feet for use in the Provadia District, according to a recent Sofia broadcast. The broadcast also added that some geophysical and geological work was being conducted in the Eastern Stara-Planina region of Bulgaria.

Back from Bahamas

Rex McFall, geologist for Superior Oil Company of California, has rejoined the company's West Texas staff at Midland after spending 3 months in the Bahamas Islands, where the company through a subsidiary, the Bahamas Oil Company, is drilling a wildcat.

Egloff to Give Lectures And Inspect Industries

At the invitation of the Institute of Petroleum of Great Britain, Dr. Gustav Egloff of Universal Oil Products Company, will deliver a series of lectures before various local chapters of the Institute in England, Scotland, and Wales during August.

Egloff also will lecture at Oxford and Cambridge universities, and will address the Catalyst Club of England in London. He also will join in Gothenburg, Sweden, a party of American scientists who will visit universities and centers of scientific and industrial research of Scandinavian countries.

Saudi Arabia Activity

Fred A. Hilton, petroleum engineer with the Arabian American Oil Company, is returning to Saudi Arabia after two months in the United States.

Preparations are being made to drill several new tests in Saudi Arabia, principally in the Abqaiq field, and that the company hopes to have five strings of tools active within the next four months, he reported. Hilton was with Tide Water Associated Oil Company in California before joining Arabian American.

Kuwait Oil Received

First shipment of Kuwait oil for Great Britain left Fahahil on July 1 bound for Grangemouth, Scotland, where refining has been resumed after a long wartime break. First cargo received at this Scottish center came late in June from Adaban.

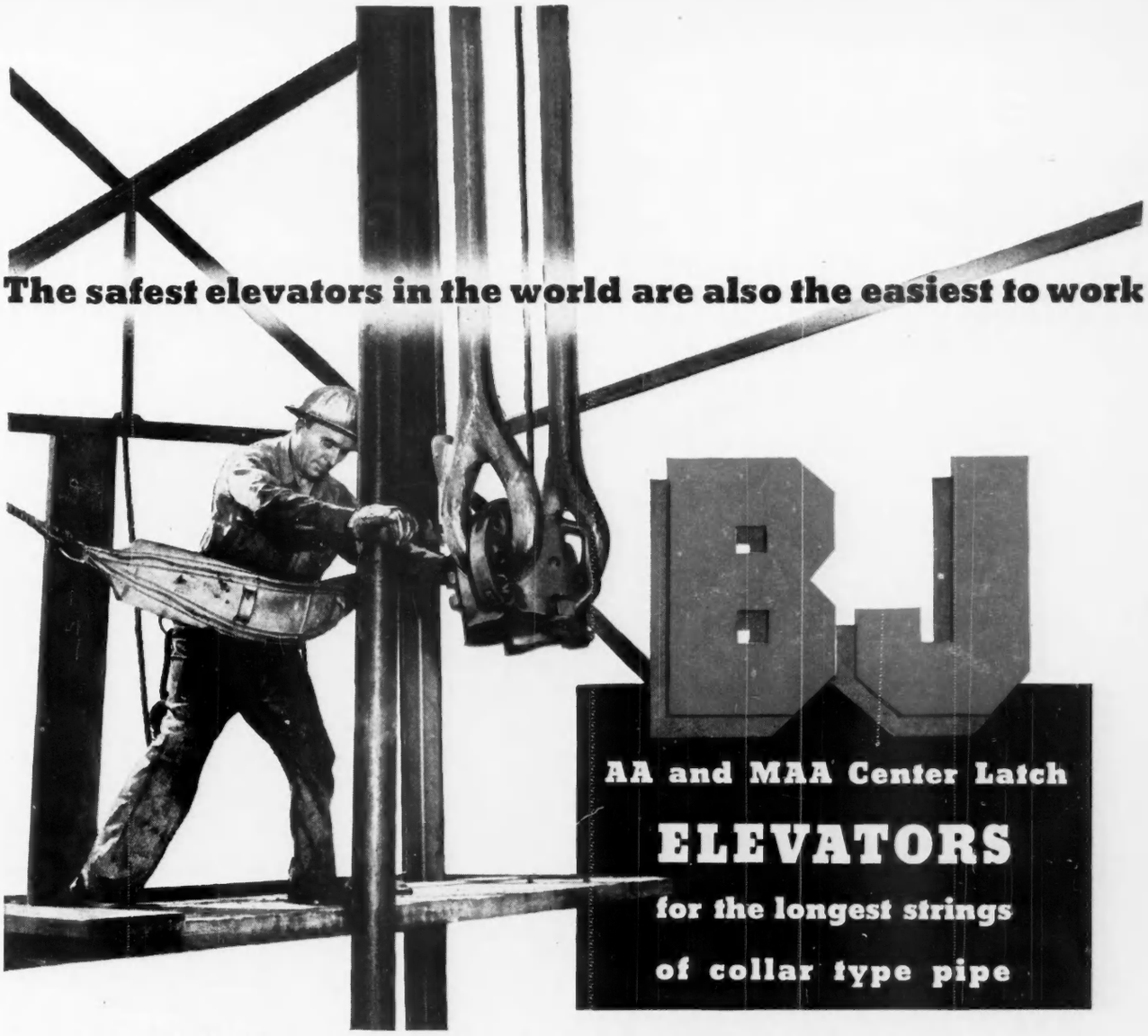
Burgan field, Kuwait, is connected by pipe line with Fahahil which is on the Persian Gulf.

Osborn to Japan

Campbell Osborn, petroleum engineer and Oklahoma oil operator, will assume charge of all chemical and petroleum industries in Japan as a member of General MacArthur's staff. During the war he served as executive officer of the chemical division of the War Production Board. In the Mid-Continent area he once was associated with Ralph A. Bard.

Trinidad Exports

Exports of petroleum products from Trinidad, British West Indies, during 1945 showed an overall increase of 4.5 percent as compared with 1944, according to the Department of Commerce. Exports of gasoline and crude oil, however, declined.



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Pemex Kept Busy During July Battling Problems of Supply and Union Labor

Officials of government-controlled Petroleos Mexicanos during July were involved not only in a battle of words with petroleum workers but in a battle of fuel supply as well. Highlights were:

1. The Sindicato de Trabajadores Petroleos (oil workers' syndicate) withdrew from the Confederacion de Trabajadores de Mexico (national labor syndicate).

2. Thousands of construction and factory workers marched through downtown Mexico City in a protest demonstration against the inability of Pemex to furnish factories with fuel.

3. Pemex published a statement in which it shifted the blame for the supply failure onto the National Railways.

Late in June, STP officials ordered a one-day work-stoppage as a protest against the failure of Pemex to deliver to them a study concerning "salary-leveling."

Gustavo P. Serrano, secretary of national economy, reproached the oil syndicate for "its policy of work stoppages which aggravate the already tragic problem of industrial production."

A few days later Efrain Buenrostro, Pemex general manager, delivered the salary study to syndicate officials who said they would begin an immediate review of the proposal and announce their findings.

Interunion Fight

During the first week of July, leaders of the petroleum workers' syndicate were ordered by Fidel Velasquez, head of the CTM, to abstain from further work stoppages. (Velasquez had promised President Camacho that walkout tactics of the oil syndicate would be discontinued.)

On July 10, the oil workers' syndicate, 30,000 strong, announced that it had withdrawn from the CTM and that the syndicate said it would deal direct with employers.

Some sources predicted that the break in relations between STP and the CTM would lead to the formation of a coalition of industrial syndicates.

STP officials charged, too, that "Pemex has spent more than 10 million pesos ($2 million) in exploration to find gas and oil in northern Mexico but on discovering a good-producing stratum that would serve to furnish the market in this area, far from exploiting it, has allowed a Texas firm to contract for the sale of fuel in Monterrey under a 10-year contract."

One newspaper said that Pemex had refused to divulge information concerning the state of its reserves. However, Alfonso de la O. Correon, company geologist, was quoted later as saying "Pemex hopes to find in the states of Tamaulipas, Nuevo Leon, Vera Cruz, Tabasco, Guerrero and the northern section of Baja California new oil-bearing stratum to offset the diminution of the yield in the Tampico area."

On July 11, officials of Pemex and the national railroads met with the secretary of national economy to prepare a plan to remedy the fuel shortage.

Pemex Gives Report

Buenrostro declared at this meeting that for the three days prior to July 11, the pipe line between the Poza Rica field and the Atzcapotzalco refinery in Mexico City had been operating at a capacity of 30,000 barrels daily, 7000 barrels above its normal capacity. He said that improvements to the Atzcapotzalco refinery, "which should be completed soon," would result in even greater quantities of fuel for Mexico City and its environs.

It was decided that the railroads give preference to the movement of fuel, and, that Pemex hasten completion of improvements on the Poza Rica-Atzcapotzalco line.

Four days later, thousands of workers demonstrated in the business district. In a newspaper advertisement signed by officials of 36 union locals, they said that ineffective distribution of oil and its derivatives had paralyzed the cement industry, affecting 40,000 construction workers, and threatened other industries. Speakers representing various units of the Federation of Workers charged Buenrostro with "bad administration" and asked his dismissal.

Pemex replied in a public statement that "the production of petroleum in the nation is more than sufficient to supply the national needs."

"The nation's consumption is approximately 9 million liters (56,610 barrels) per day," the statement said, "and during the first six months of the present year our production has averaged more than 12 million liters (75,480 barrels per day). As the production exceeds considerably the internal demand, Pemex has exported an average of 2.2 million liters (13,838 barrels) daily from January to June of this year.

"Therefore, the scarcity which has been observed in some sections of the country, and specifically in the federal district, is due to the insufficiency of our railway system. In Vera Cruz and Tampico we always have on hand enough oil to supply the demand. . . .

"The limitations of production in Atzcapotzalco, in relation with demand, have hindered the establishment in the federal district of a sufficient volume of reserves to meet important emergencies. Nevertheless, we have endeavored to keep our available supply in Atzcapotzalco from falling below 15 million liters (94,350 barrels), but the transport crisis and others (walkouts) have brought about a progressive reduction of these reserves which at the beginning of April totaled 13 million liters (81,770 barrels) and which at the beginning of June had dropped to 4.5 million liters (28,305 barrels).

"The principal causes of the reduction of our stocks on hand were the necessity of making special deliveries, that is to say, to satisfy demands not ordinarily furnished from production at Atzcapotzalco.

"The volume available for distribution, beginning as of now, will be 250,000 liters (1573 barrels) more per day. In addition, a fleet of trucks will operate over highways for delivery to firms which must absorb the freight charges.

"Because of the impossibility of transporting by railway from Minatitlan to Salina Cruz the volumes of fuel required. We have established a permanent shipping service from the Gulf of Mexico via the Panama Canal to our storage plants in Manzanillo, Mazatlan and Guaymas."

"Lack of Vision"

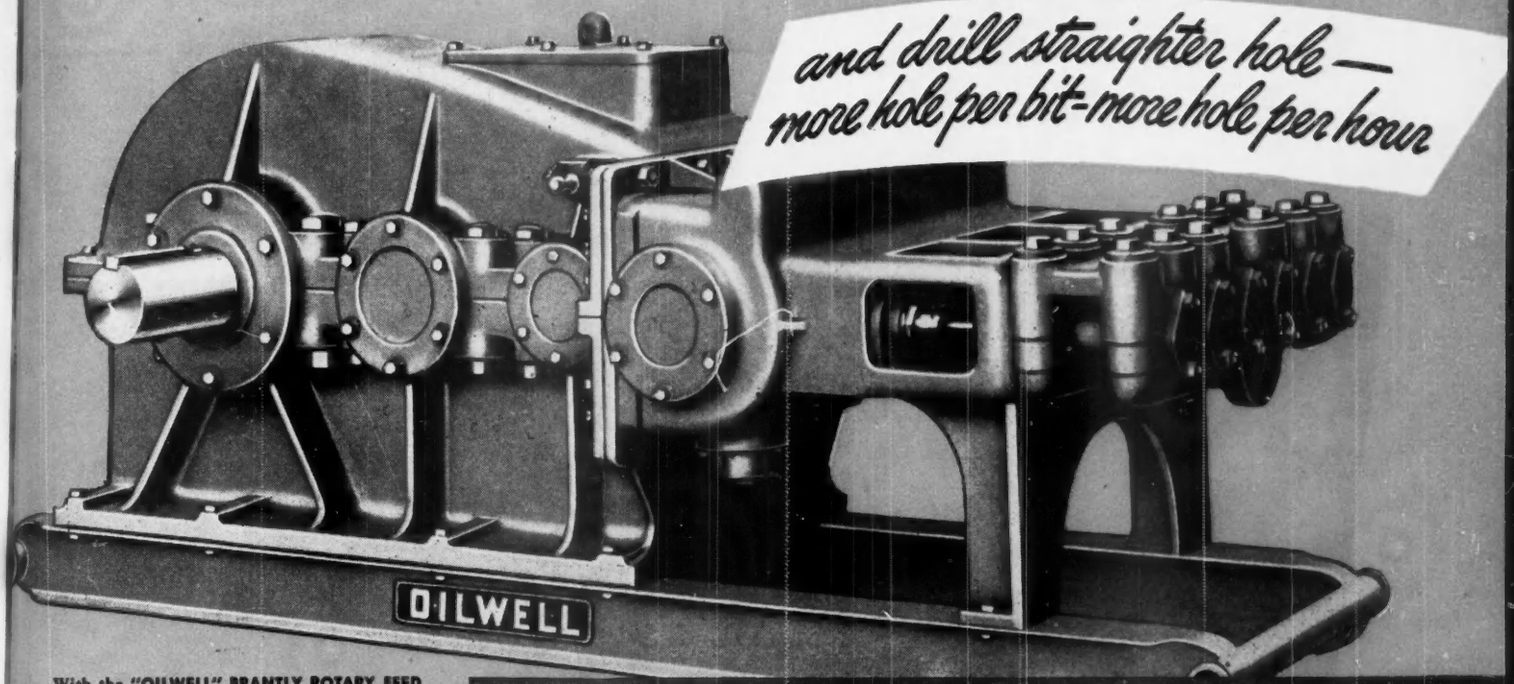
As the month drew to a close, Section 34 (a Mexico City local of the oil workers syndicate) said that Pemex officials were responsible for the shortage of reserves "through their lack of vision in solving these problems."

"Since prior to the expropriation," they said, "large storage tanks have been in existence which could have been filled with reserves for any contingency. Since 1938 Pemex has not concerned itself with the question of reserve shortage."

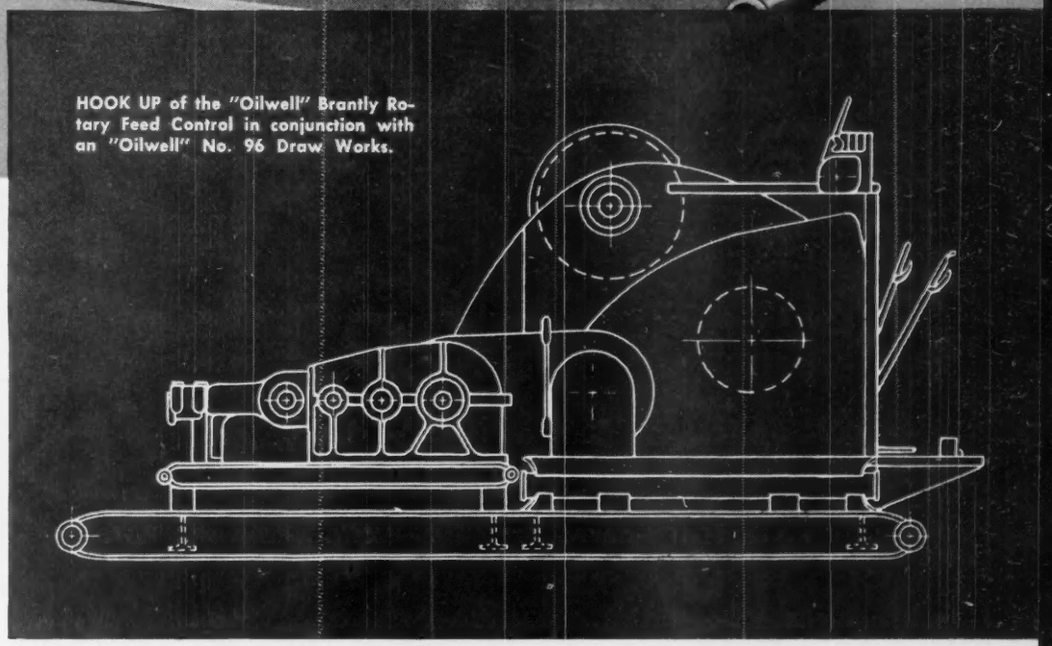
Because of this shortage of reserve stocks, the section spokesmen said, "any slip of the national railways provokes a serious economic problem."

Say goodbye to JERKY hand-feeding on drilling rigs with "Oilwell" Brantly Rotary Feed Control

and drill straighter hole — more hole per bit-more hole per hour



With the "OILWELL" BRANTLY ROTARY FEED CONTROL, manual effort is eliminated and by means of a simple valve, the driller controls the rate of feed for the desirable weight to be carried on the formation encountered.



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This contributes materially to hole straightness because it enables the driller to keep the drilling string in tension at all times. Furthermore it allows him to release the brake lever entirely when drilling; thus avoiding the customary jerky feed-off which results from slipping the brakes.

Uniform weight on the bit assures maximum cutting-life. This means *more hole per bit—fewer bits—and a reduction in bit costs.*

Because of this increased bit-life, fewer round trips are necessary and you get *more hole per hour.*

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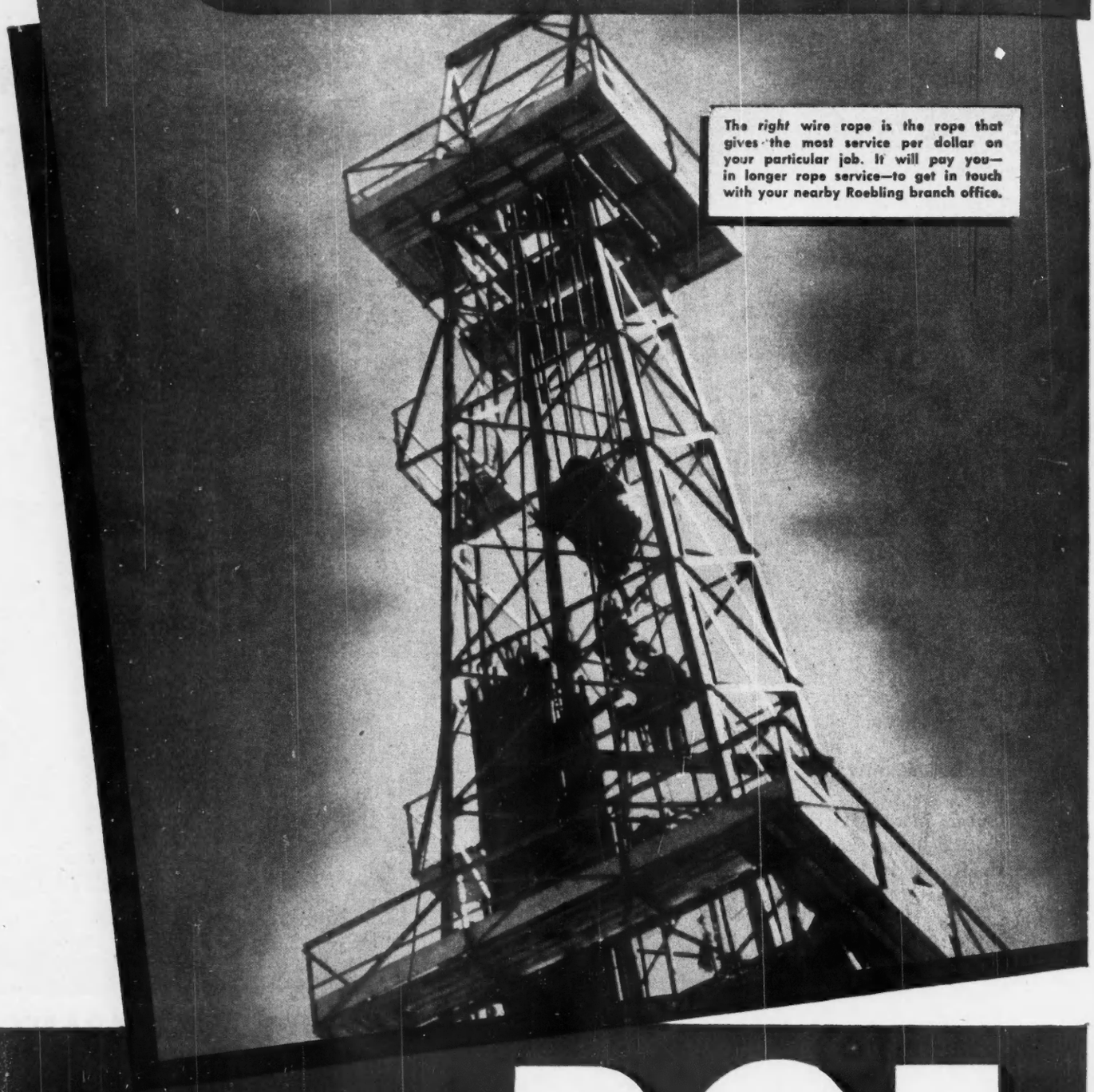
HOW TO CHOOSE



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ROE

PACEMAKER IN

THE OUTLOOK

Venezuela's move for bids on her royalty oil is believed to have resulted from U. S. broker offers much higher than concession operators could give in long-term agreements. Some think the move is designed to force higher royalties from American companies.

* * * *

Production notes: a) Passenger automobile production goals: 287,000 in August, 311,000 in September and 395,000 in October. Shortage of lead and restrictions on steel are the big drawbacks. b) On order August 1 were 522 diesel railway engines.

* * * *

Two views: A tubular goods man told The OIL WEEKLY that effects of a prolonged Great Lakes shipping strike would not be felt by the oil industry until next winter when steel output will suffer because of inability now of mills to build up their ore stockpiles. CPA officials say that barring new strikes and prolongation of the Great Lakes tieup, production of iron and steel will be sufficient by year-end to permit easing of priority and allocation rules and that some curbs will be removed entirely.

* * * *

The State Department will press its suggestion that the United Nations assume some sort of control over world oil production.

* * * *

The United States is seen as demanding a show-down with Russia in the near future on the question of oil in Austria, Roumania and Hungary; in the first and last countries the Reds are confiscating all the oil produced and have stripped Roumanian fields in order to boost Hungarian production to ruination levels.

* * * *

Labor and management hereafter will be left to settle their differences between them, without government interference barring a work stoppage that threatens the nation's economy. President Truman's announcement that he would not seize two strike-bound farm equipment plants is seen as setting the pattern for abandonment of a favorite wartime policy. Some, like the Communists, who favor nationalization of all industry, aren't so pleased with the change.

* * * *

The 18-nation conference called by the United Nations' economic and social council to prepare for the international conference on trade and employment, tentatively set for October 15 in London, will not deal with the new reciprocal trade agreements which the State Department plans to negotiate. The agreements may come before the big trade meeting, to be held next year, but only after they have been worked out by the department on the basis of hearings before the Committee for Reciprocity Information.

* * * *

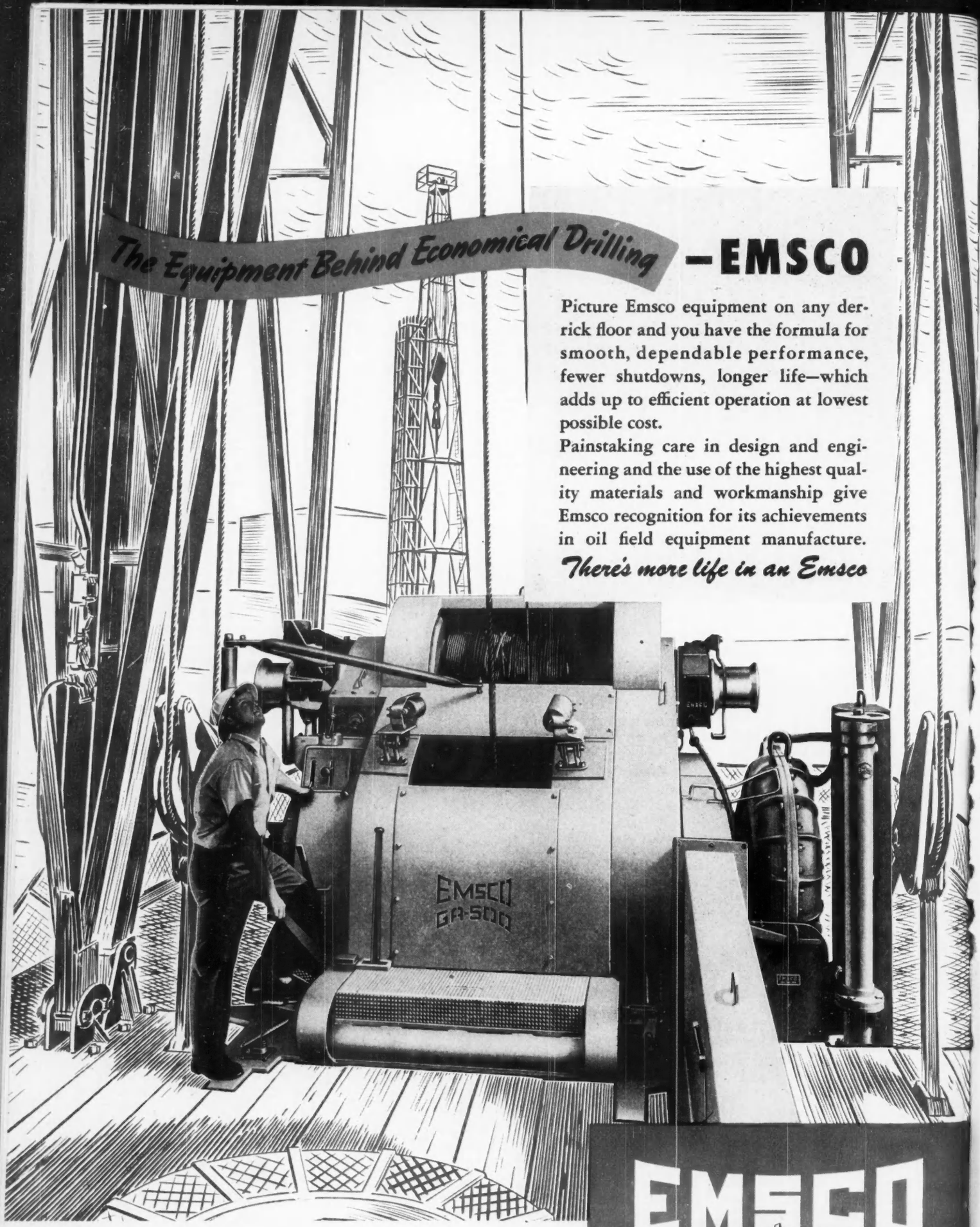
Future negotiation of AFL wage contracts may include a demand that employers and labor representatives also agree as to the number of workers the former will need to carry on their business. The contention that labor should dictate the number of workers to be employed, as well as their hours and wages, was advanced by AFL President William Green in announcing the organization would fight the Lea Act forbidding the use of force, intimidation or duress to compel a radio broadcaster to employ more workers than are needed to perform actual services.

* * * *

Tough building restrictions imposed to expedite housing construction will continue until the first of the year practically unchanged and then will be relaxed only gradually. There will be no lifting of the regulations October 1, as has been reported, and it will be many months before industry can go ahead with any type of construction without asking government permission.

* * * *

The severe shortage of bituminous coal resulting from the strike, and a possible deficiency in anthracite, will throw a heavy burden upon fuel oil next winter.



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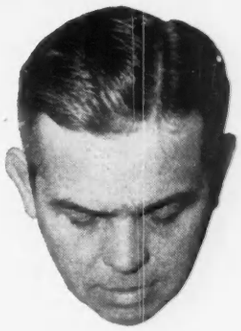
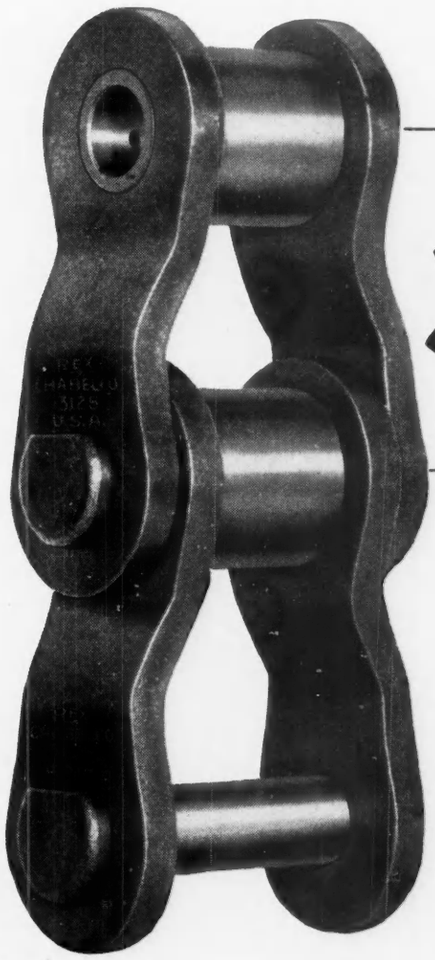


Rex Field Engineer



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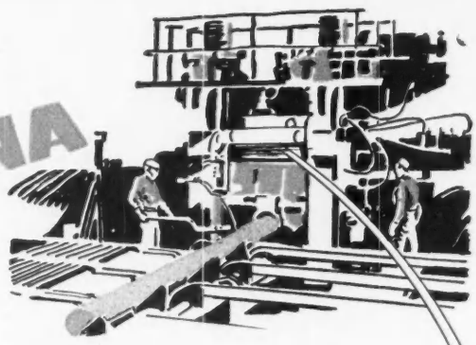
Youngstown to COASTAL LOUISIANA



COASTAL Louisiana has made a major contribution to America's oil supply since big production really got under way in the "thirties". With well over a billion barrels in proved reserves, it promises to be one of the country's great producing areas for many years to come.

Holding the world's highest average for deep wells, Coastal Louisiana presents many peculiar operating problems, both with reference to transportation and drilling operations. Ever since the Jennings discovery back in 1902, oil men in Coastal Louisiana have keenly appreciated the importance of an always reliable source of good drill pipe, casing, tubing and line pipe. They have known Youngstown for dependable pipe through most of its entire history. In the years ahead, oil men in this field and elsewhere can continue to rely on Youngstown for quality oil country tubular goods to meet all present and future problems of the industry.

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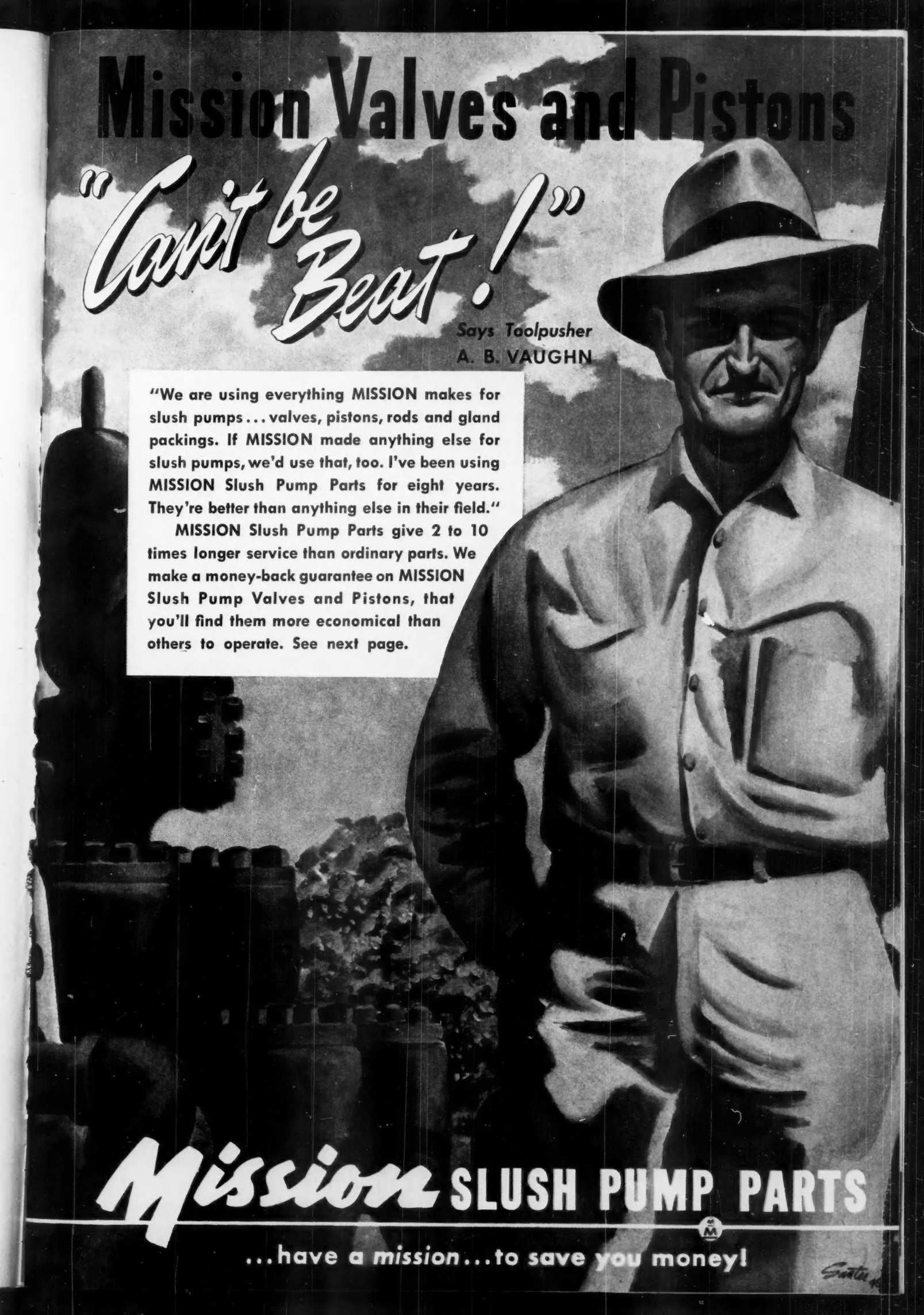
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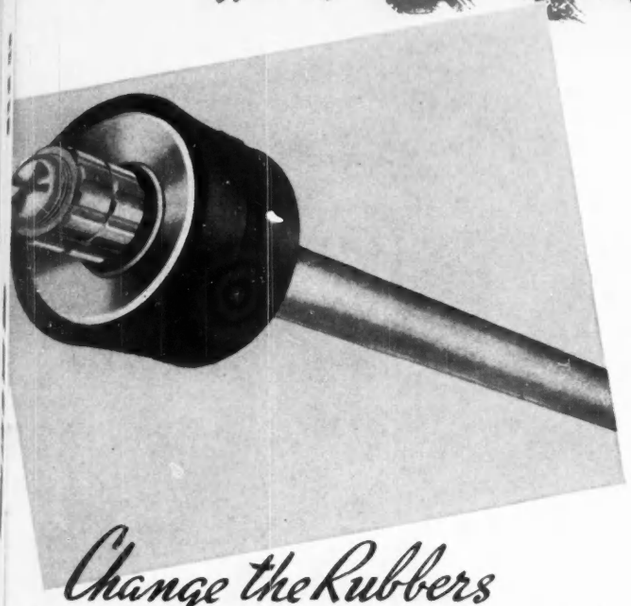
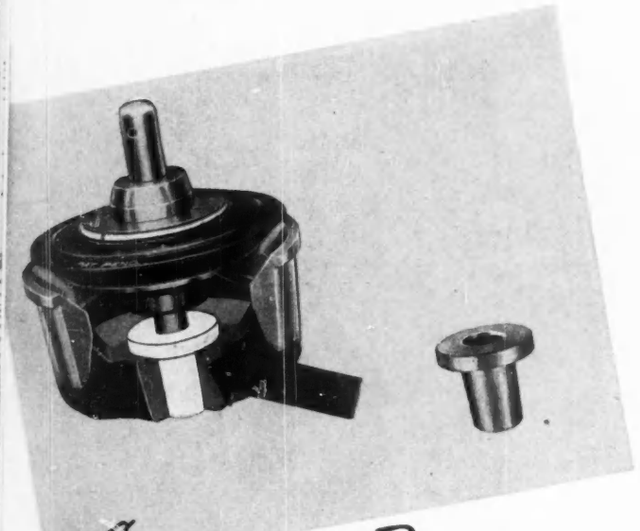


Change the Rubbers and save the Piston!



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MISSION SUPER-SURFACED RODS last ***two to four times as long*** as file-hard rods . . . ***twice*** as long under normal conditions . . . up to ***four times*** as long under corrosive conditions. These rods do not pit even when salt or brackish water is used. Mission also makes a superior file-hard rod. ALL MISSION Rods have 120,000-lb. core tensile strength, with high ductility . . . and are ***guaranteed*** against breakage.

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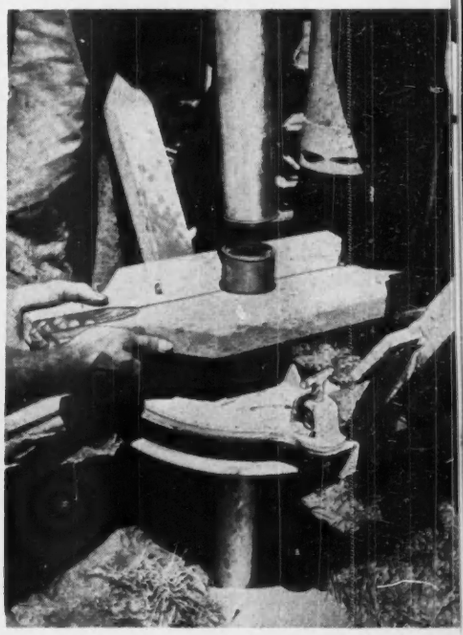
The simplicity and speed of assembling charges of Du Pont "Nitramon" S help make this safest blasting agent the leader in the field. The pictures illustrate the versatility of "Nitramon" S used in large or small diameter, wet or dry, deep or shallow drill holes for reflection or refraction shooting.

E. I. Du Pont De Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

"Nitramon" S in 2-inch diameter comes in units of four pre-assembled one-pound cans. These pre-assembled units speed making up charges of the required strength for reflection shots. "Nitramon" S Primers are packed separately.

Takes less than a minute to assemble a 20-pound charge. A good strong turn fastens the units securely together, and the complete assembly forms single column that remains rigid even under adverse poling conditions. "Nitramon" S Primer is the top can.

Quick twist of the wrist tightly joins sturdy 3-inch dia., 5-pound cans of "Nitramon" S in assembling 25-pound units for loading deep, dry holes. These are often "pot shot" to permit concentration of load at bottom of hole, desirable for refraction shooting.



20-pound unit, 3-inch "Nitramon" S is readily attached to top can of long column already lowered into deep water-filled hole. Wooden clamp supports weight of the column. "Nitramon" S cans resist pressure and water and are safely loaded in "sleeper" holes.

DU PONT "NITRAMON" S

A Product of Du Pont Explosives Research

DU PONT
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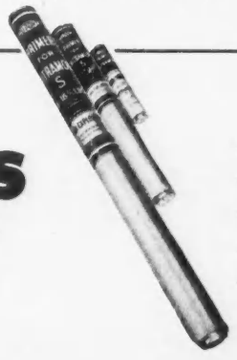
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY



OUTSTANDING FEATURES OF "NITRAMON" S

- Maximum safety.
- Charges easily assembled.
- Proper priming assured.
- Quicker loading.
- Strong, rigid columns.
- Less friction . . . less poling.
- Water-resistant containers.
- Sturdy cans resist pressure.
- Admirably suited for "sleeper" holes.
- Non-headache-producing.

DIAMETERS	WEIGHTS
2-inch	1 lb. or 4 lbs.
3-inch	5 lbs. or 10 lbs.
4-inch	16⅔ lbs.

CP Three-Cone Bits (Type E) are noted for the added margin of safety provided by their ball and roller construction plus a special patented hold-on feature. Rugged bearings prolong bit life. Water course bushings are readily replaceable with no special tools required for the job. Correct sizes and shapes are quickly inserted and locked into place with a screw driver.

CP Three-Cone Bits are available in Types ES for soft formations; Types EM for medium to hard formations; and Types EH for hard to extremely hard formations. Prompt service is assured in Oklahoma, Texas, Kansas, Illinois, Kentucky, Louisiana and the Rocky Mountain States.

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★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

BUDA'S *unbeatable hand...*

and here's why—

These five BUDA "1879" Oil Field Engines give you:

- **INTERCHANGEABLE MOUNTING DIMENSIONS!**
- **INTERCHANGEABLE PARTS — SAME BORE AND STROKE!**
- **OPERATION ON ANY FUEL AVAILABLE TODAY!**
- **180 USEABLE HORSEPOWER — "STANDARD"!**
- **240 USEABLE HORSEPOWER — SUPERCHARGED!**
- **BACKED BY "ON-THE-SPOT" OIL FIELD SERVICE!**

. . . the combination of these advantages makes "an unbeatable hand" for any oil field operator to hold.

The BUDA Oil Field Engine models illustrated in the Royal Flush are:
(Ace) — 6-PCS-1879 Supercharged Natural Gas — Butane — Propane Engine.
(King) — PCG-1879 Natural Gas — Butane — Propane Engine (Convertible to Diesel)
(Queen) — PCD-1879 Diesel Engine — (Convertible to Natural Gas — Butane or Propane)
(Jack) — 6-DCS-1879 Supercharged Diesel Engine.
(10 spot) — PC-1879 Natural Gas — Butane — Propane Engine.

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NEW MEXICO—Artesia • KANSAS—Great Bend • ILLINOIS—Salem
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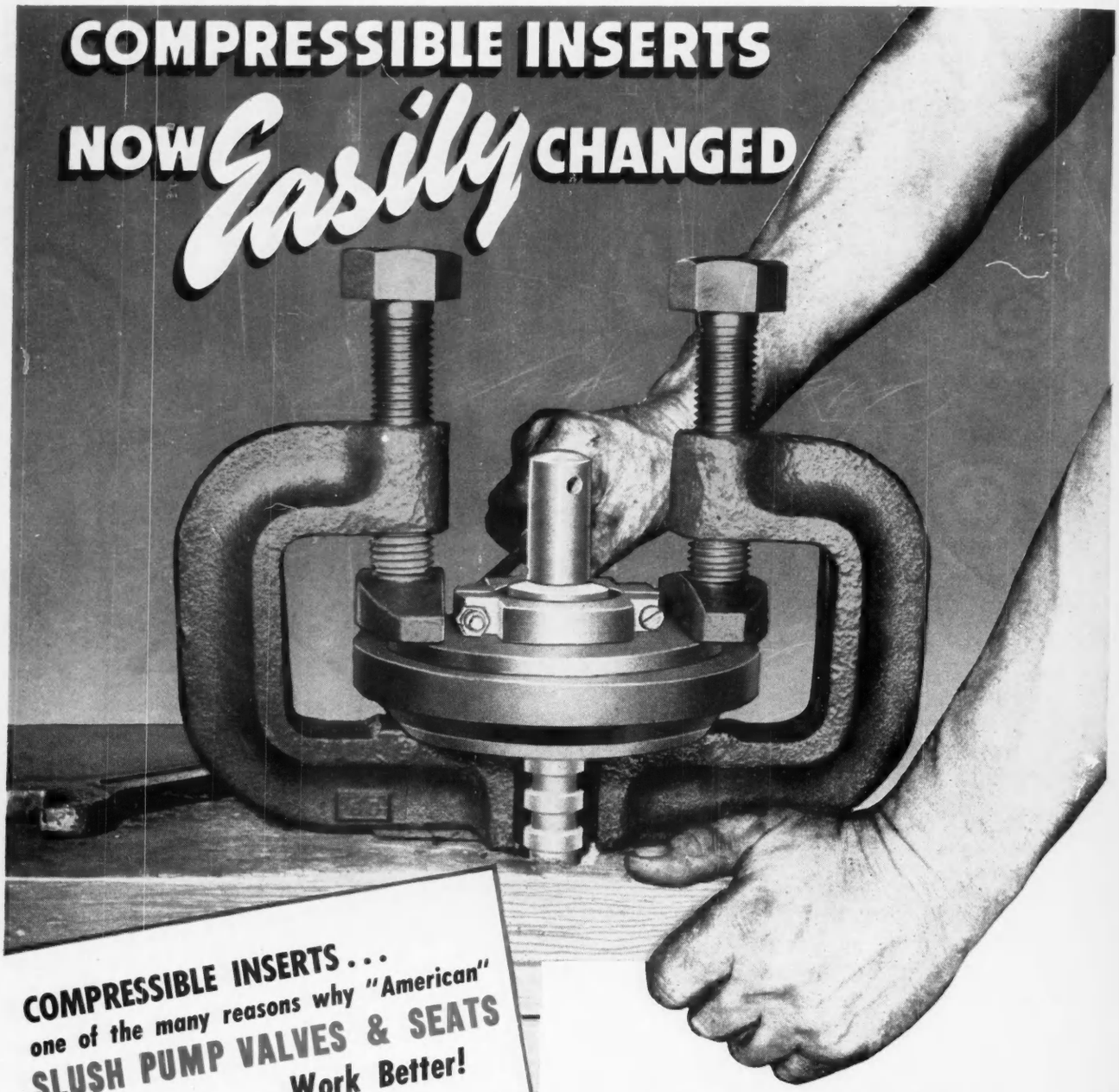
WYOMING—Casper.

COMPRESSIBLE INSERTS NOW *Easily* CHANGED



COMPRESSIBLE INSERTS . . .
one of the many reasons why "American"
SLUSH PUMP VALVES & SEATS
Last Longer . . . Work Better!

- Since all parts are in complete compression in "American" inserts (which are the only complete compressible inserts made), there is no possible chance of any component parts of the valve working loose Therefore, much needless wear, such as occurs in valves not using this principle, is prevented!
- Because they are big and tough—and in compression—"American" inserts take the initial heavy impact "on the chin" . . eliminating the metal to metal shocks which are so prevalent in most valves and seats.
- And because they are in complete compression, "American" inserts are impervious to the effects of mud mixtures which create rubber shrinkage and flowing in most valves and seats.

Here's good news for you Roughnecks! We've designed and are making the above Double "C" Clamp Unit, which can be firmly and permanently attached to your work bench. You'll have no more "gripes" about changing "American" valve inserts! This clamp makes it easy to do the job double-quick! Now you can have all the added advantages of our compressible inserts—without taking any additional time or extra effort to make the change.

See your supplyman or write us direct for your Double "C" Clamp Unit. It's available at a give-away-price!

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